The UNESCO Courier
A WINDOW OPEN ON THE WORLD

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COVER PHOTO

Greece was once the most malaria-ridden country in Europe. Fourteen years ago it was picked as an advance post in the world war against the disease. Today, with malaria practically driven out it has scored a resounding victory. Photo shows two girls in a malaria-free village of Greece. (See story p. 14)

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WHO Photo by Eric Schwab

THOUSANDS OF TEAMS, millions of tons of supplies and materials are needed in the World Malaria Eradication Campaign now being waged by 92 countries. Above, sections of two of India's 390 malaria eradication units. Each unit comprises 4 trucks, 3 jeeps, 2 pick-ups and 247 administrative and field workers. The cost of setting up one unit is $105,000.

WORLD Health Day this year is devoted to the world's most costly disease, malaria, and the world campaign for its eradication.

Never before in history have the nations concerted their efforts on such a scale against a single disease. Without a dissenting voice the ninety Members of the World Health Organization have resolved to pool their knowledge and resources to achieve nothing less than the complete elimination of this disease from our globe. This year's World Health Day will, I hope, serve to recall to all peoples the urgency of this great undertaking.

Malaria remains in 1960 a constant threat to more than 1,000 million human beings. For the most part these are people who already have more than their share of sickness and poverty, and can least afford to be further weakened in their struggle against misfortune.

Malaria strikes first at a country's most precious resource, its young children. The disease is held responsible for 10% to 15% of infant mortality. It can also depopulate large territories.

The man who carries the malaria parasite in his blood is a man of blunted initiative. To him few things seem worth the trouble, he becomes fatalistic, and the physical deterioration that he suffers makes him an easy prey to other dangerous diseases.

Today we know how malaria is transmitted, and by what mosquitos. We know how the malaria parasite behaves within the human body, and how it causes a fever that may lead to death. We have found effective ways of destroying the mosquitos and we possess drugs that successfully attack the parasites within the human body. Techniques for fighting malaria are becoming more powerful and precise.

But we know also that the deadly mosquitos have found ways of fighting back; that is why speed is

WORLD ASSAULT AGAINST A SINGLE ENEMY: MALARIA

WHO photo, drawing courtesy Imperial Chemical Industries, England

DEADLY CARRIER of malaria is the anopheles mosquito. Shown here is Anopheles Gambiae, main carrier of malaria in Africa. This drawing of its head has been greatly enlarged.

by G. Candau

Director-General
World Health Organization

essential. The campaign against malaria must be carried through while the weapons still remain effective. There must be no slackening of effort until the disease has been entirely stamped out, and the last remaining case in the remotest corner of the earth has been tracked down and cured.

WHO's member countries have given the Organization a heavy responsibility; that of guiding a global campaign for the complete and unconditional liberation from malaria of twelve hundred million human beings in 148 countries and territories throughout the world.

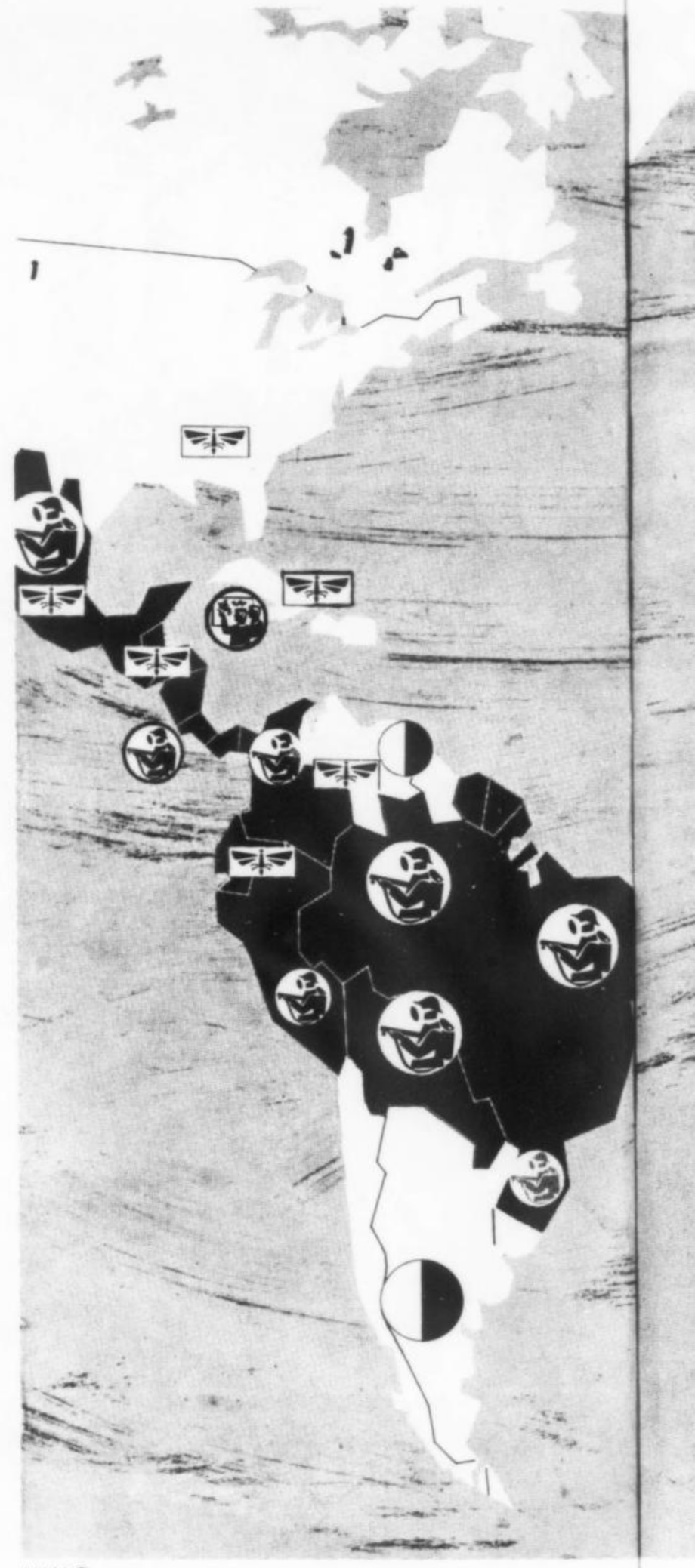
The antimalaria operations that are at present proceeding, at one stage or another, in 92 countries and territories constitute the greatest co-ordinated public health programme ever undertaken in the world's history. In 13 of these countries, malaria cases have been reduced to a handful occurring sporadically or introduced from outside. However, there are still 56 countries where no effort has yet been made to subdue the malaria monster.

The world antimalaria campaign evidently calls for large numbers of trained workers of many kinds, quantities of equipment and supplies, considerable financial investment and efficient administrative machinery. It is even more important, however, that the governments engaged in the campaign should pursue it with conviction and with the determination to succeed.

The eradication of malaria is a challenge to all the world. In an era when man thinks he is about to set foot on the moon, he should on his own planet be capable of stamping out one of his oldest and most destructive enemies.

There is no doubt in my mind that the countries of the world are today in a position to accept this challenge. To do so is indeed a question of honour. What is needed more than anything else is the will to eradicate malaria, for today the way is there.

1,000 MILLION LIVES IN DANGER



W.H.O map.

TODAY twelve hundred million human beings are living under the constant threat of malaria. It is not a spectacular disease. Its victims show no wounds or mutilations to excite our pity ; it comes upon them as they sleep, in the stillness of the night, carried by a silent attacker, the mosquito. It is the "fever" long believed to be inescapable in tropical countries, more of a nuisance than an illness people said.

The truth is that malaria is a disaster, and its terrible consequences among that third of the world's population which already has more than its fair share of disease and poverty cannot be easily visualized in countries that are free of it. Malaria epidemics can be just as destructive as plague epidemics. Those who live in malaria-ridden areas, however, have become resigned to it, and accept it as a natural part of their everyday life. Its victims are quite unaware of the physical and moral deterioration it has brought about as through countless centuries it has sapped their strength, robbed them of initiative, and made them vulnerable to other, more deadly infections. Moreover, it is estimated that malaria accounts for 10-15 per cent. of infant mortality in these countries.

The ultimate aim of the present world-wide antimalaria campaign is to eliminate the disease, to wipe it off the face of the globe, never giving up until the very last case in the remotest corner of the earth has been tracked down.

The necessity for this giant undertaking was formally and unanimously recognized by the representatives of all the governments attending the Eighth World Health Assembly in Mexico City in 1955. The World Health Organization was given charge of this world-wide operation which was to be something quite new in medical annals.

This was to be a health programme presenting many features of a military campaign, and one whose aim was not merely the surrender, but the extermination of the enemy. An antimalaria army came into being, with its intelligence service, its supply lines, its transport facilities, its arms and munitions depots, its logistics offices, its general staff and its high command:the last an office of modest dimensions in the pleasant setting of Geneva. It is occupied by Dr C. A. Alvarado, Director of WHO's Division of Malaria Eradication and chief of the 329 international malaria experts now at work in 73 different countries.

"We are engaged on a monster programme", Dr Alvarado admits. "It calls for tens of thousands of teams, and millions of tons of supplies and equipment. Hundreds of millions of homes must be visited, hundreds of millions of blood tests carried out, and tons of drugs supplied. Thousands of lorries, cars, bicycles, donkeys, camels, elephants and boats are needed. We must co-ordinate the work of hundreds of laboratories, help establish contacts and exchange of information between hundreds of research and laboratory workers, arrange meetings of experts, translate reports from many different countries so that they can be understood in the others.

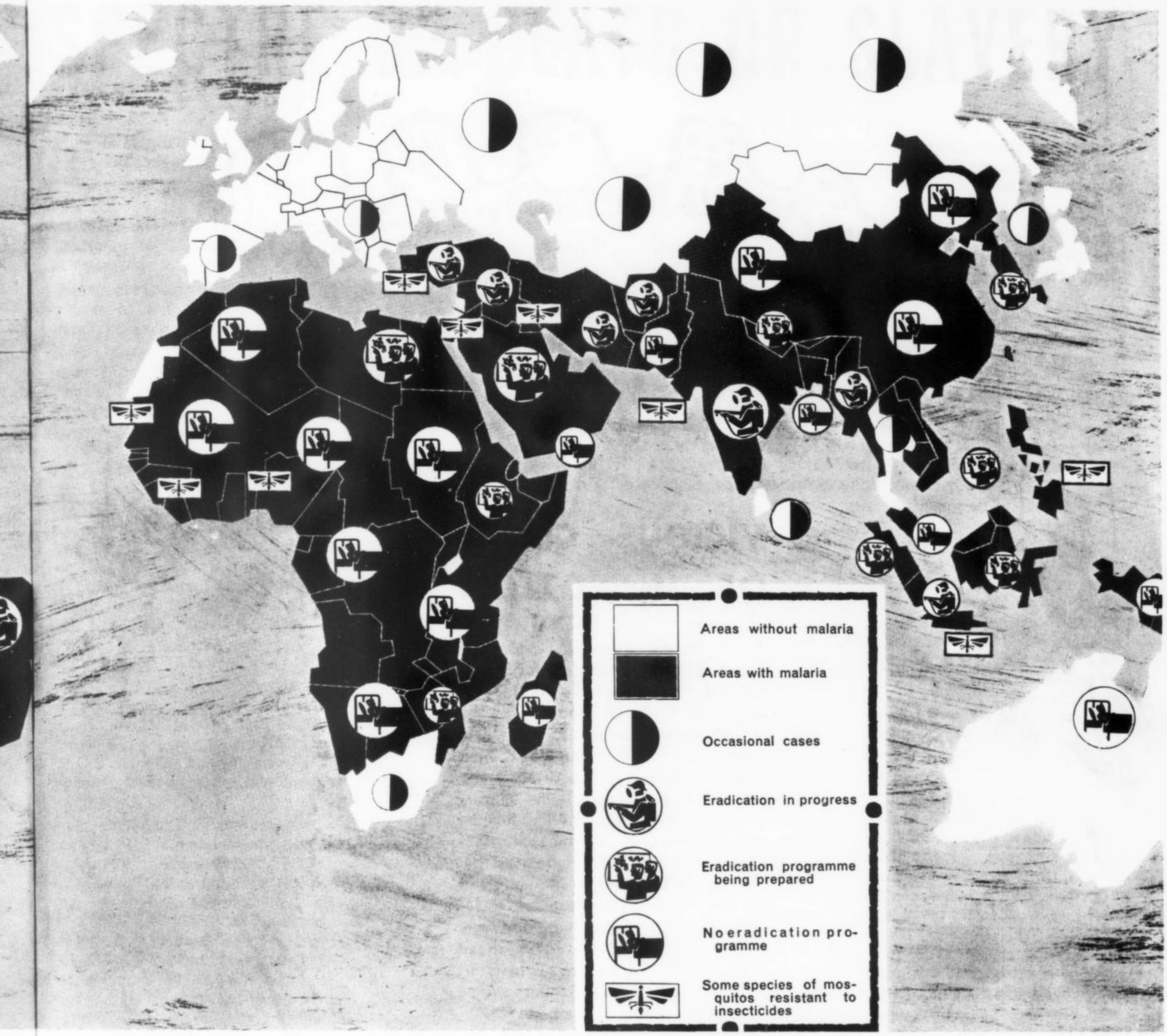
"This drive to wipe out malaria also means making thousands of maps, taking a census of population in the affected areas, keeping a check on the movements of millions of nomads, giving lectures, and holding open-air discussions with villagers to convince them of the need for the action being taken.

"Malaria eradication", says Dr Alvarado, "is above all an organizational and administrative problem, for we now know almost all we need to know about its scientific and technical

Never before have concerted international forces on such a scale been deployed against a single disease.

Never before have doctors, engineers, laboratory workers and helpers of all kinds been mobilized in such large numbers in so many different countries to combat the same evil.

Never before has a scheme been launched that so intimately affects the living conditions of such vast numbers of the earth's inhabitants.



aspects and researchers are working hard on the few remaining unknowns. But malaria eradication is also a question of money. According to our estimates, the campaign costs rather less than one dollar for each human being being freed from the menace of malaria".

For thousands of years malaria remained a mysterious affliction, which seemed connected with the presence of marshes or other unhealthy surroundings. The foul smells arising from stagnant water were also held responsible. The first step towards solving the mystery was the discovery, in 1880, by a Frenchman, Laveran, that malaria was caused by a parasitic organism, a haemosporidium (plasmodium). In 1898 a British doctor, Ronald Ross, showed that the parasite of bird malaria is transmitted by female mosquitos, and the same year Italian scientists proved that the human parasite is carried by *Anopheles* mosquitos.

Up to that time malaria patients had been treated with cinchona bark, which later became quinine, and blood-letting was also practised. Whenever they could, people would move away from areas that were believed unhealthy, thus, without realizing it, escaping the risk of contact with mosquitos. Water management and marsh drainage schemes were also carried out.

It was the discovery of DDT by a Swiss, Paul Müller, who was awarded the Nobel Prize for it, that completely changed the outlook in the fight against malaria after the Second World War.

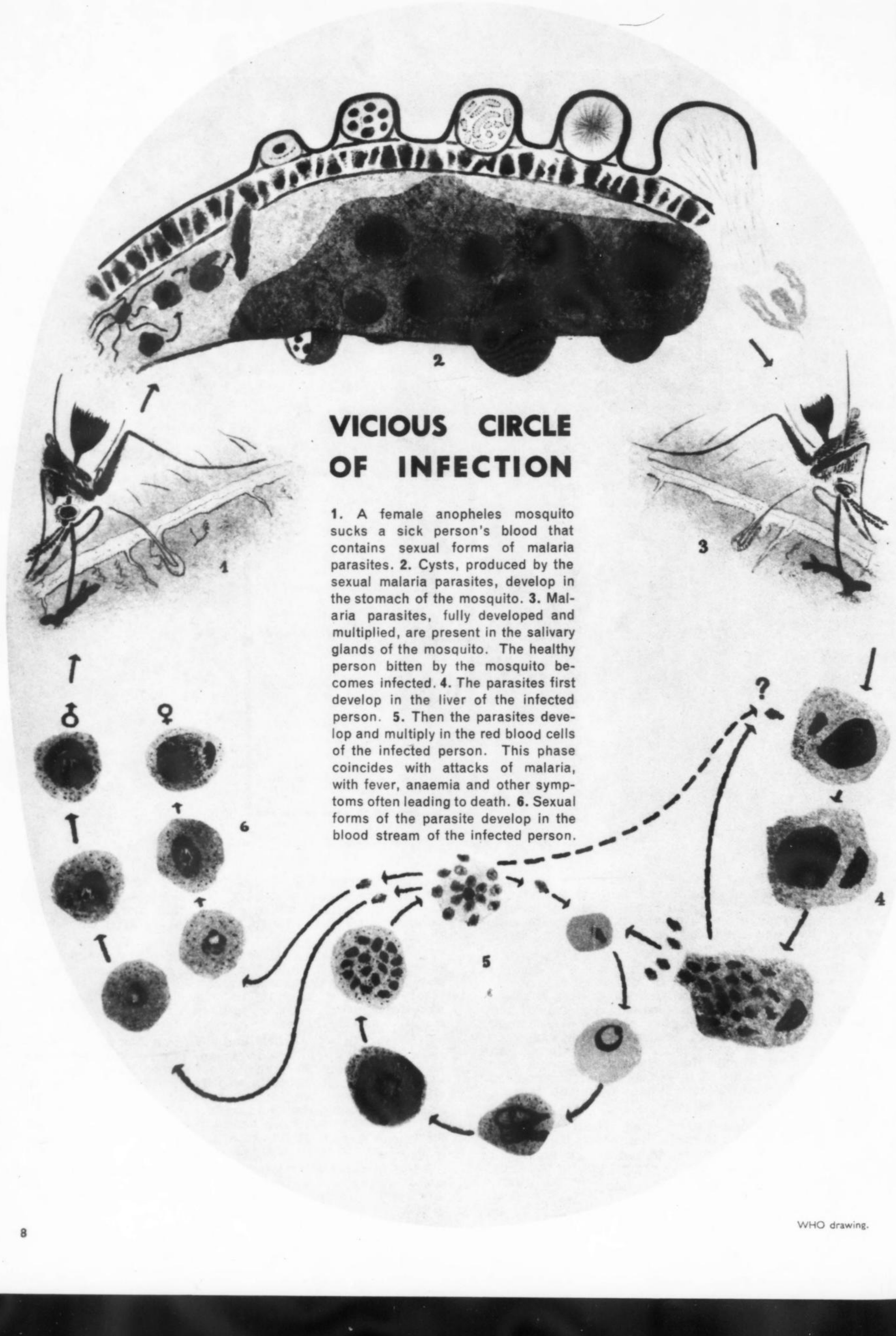
It transformed malaria control into a simple operation of spraying this "residual" insecticide on the inside walls of dwellings, where the mosquitos rest after feeding on human blood. The poison killed off the mosquitos. Malaria sufferers were then given medical treatment, and the spread of the disease was thus halted.

It seemed that the battle had been won. At last the anti-malaria campaigns would extend beyond the privileged areas to all the villages and hamlets where they were most badly needed. It would be possible for the first time to estimate the time and money required on the basis of the size of the population to be protected and the average wall surface to be sprayed per head. The amount of insecticide needed, the number of spraying pumps, the manpower involved, and so on could then be accurately worked out.

The war against malaria had entered a new phase, in which science and logistics were paramount. The way was now open for the huge eradication programme that was soon to be launched.

VICIOUS CIRCLE OF INFECTION

1. A female anopheles mosquito sucks a sick person's blood that contains sexual forms of malaria parasites. **2.** Cysts, produced by the sexual malaria parasites, develop in the stomach of the mosquito. **3.** Malaria parasites, fully developed and multiplied, are present in the salivary glands of the mosquito. The healthy person bitten by the mosquito becomes infected. **4.** The parasites first develop in the liver of the infected person. **5.** Then the parasites develop and multiply in the red blood cells of the infected person. This phase coincides with attacks of malaria, with fever, anaemia and other symptoms often leading to death. **6.** Sexual forms of the parasite develop in the blood stream of the infected person.



WHO drawing.

SPECTRE OF DEATH OR SLAVERY

THE eradication of malaria will free humanity from a ruinous disease that is a disgrace to our time.

Other diseases may decimate a population; malaria can depopulate a whole region. Those it does not kill it enslaves. Throughout history it has driven men off vast tracts of fertile land. And those that stay on, drag out a miserable existence.

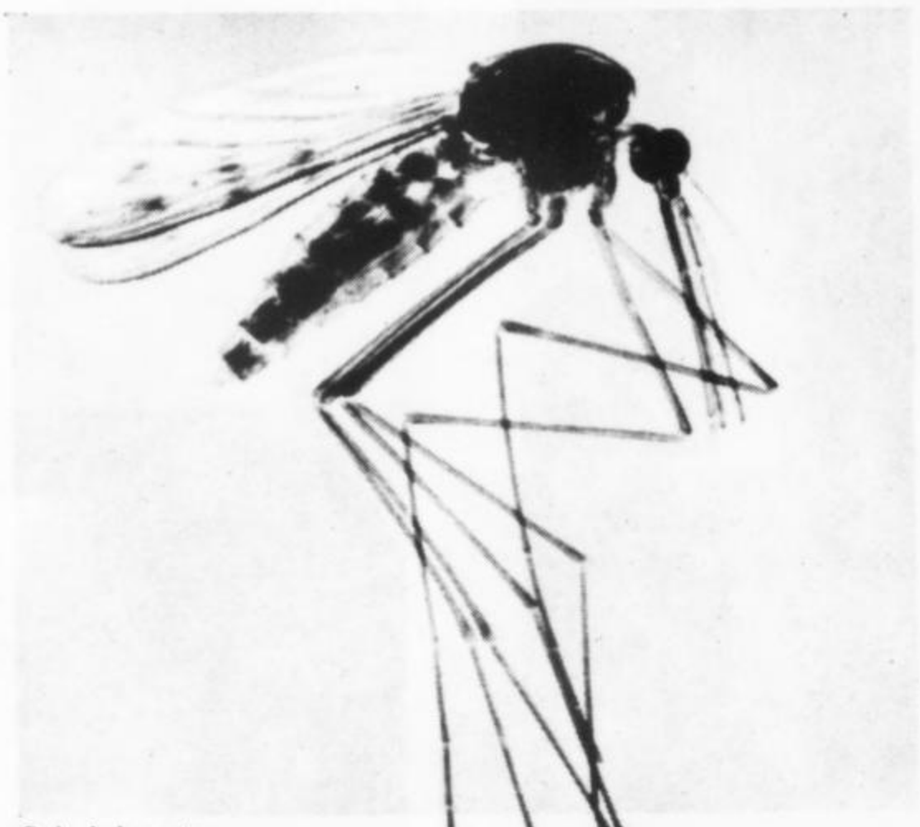
These are facts that no one questions. Yet conclusive proofs of the economic benefits resulting from malaria eradication are difficult to obtain.

Nevertheless, the reports that WHO receives from all over the world provide some valuable indications about the economic, social and human significance of the present antimalaria drive.

IN **Afghanistan,** about one million peasants lived under the constant shadow of malaria, and some of the most fertile land could not be cultivated because of the ravages of the disease. The total cost of antimalaria operations between 1949 and 1959 did not exceed $750,000, whereas malaria was the cause of a yearly loss of earnings amounting to about $20,000,000.

In **Ceylon,** the disappearance of malaria has resulted in a saving of about $30,000,000 per year, that is, six times the total expenditure on the ten-year antimalaria campaign.

In **India,** the figures supplied by Dr. K. Viswanathan, malaria adviser at the WHO Regional Office in New Delhi, are really astronomic. He estimates that the annual economic losses caused by malaria in that country are in the neighbourhood of $ 500,000,000 corresponding to loss of wages, loss of output, etc. affecting the fifty million Indians who fall victims to the disease every year. On the other hand, he has calculated that the total cost of a malaria eradication programme of several years' duration in India would not exceed $ 190,000,000, i. e. much less than the amount of the present yearly losses.



© L. J. Laporte

In **Mexico,** where 175,000,000 dollars' worth of economic damage is caused every year by malaria, the total cost of the five-year eradication programme is expected to be about $20,000,000.

In **the Philippines,** the uprooting of malaria has made possible many projects which previously were out of the question: construction of roads, opening of mines, building of houses and industrial premises.

In **Thailand,** it has been estimated that fifty million agricultural-worker/days were lost each year on account of malaria. This is equivalent to a rice harvest worth $15,000,000, whereas the cost of the malaria eradication programme from 1954 to 1958 was $500,000 per year.

In **French Guiana,** infant mortality decreased by more than 50 per cent. since the large-scale antimalaria operations carried out in 1949-1951.

According to a survey made in **Nigeria,** babies born of malaria-infected mothers weighed on an average about 150 grammes (5 oz.) less than ordinary babies.

According to Dr. Belios, Director of the Malaria Department in **Greece,** the average height of army recruits has increased by 4-5 cm. since malaria has practically disappeared from that country.

Behind these dry facts and figures, and ignored in the economists' calculations, is an ocean of human misery and despair—generation following hopeless generation in half-alive villages amid half cultivated fields.

Through the centuries entire peoples have physically and mentally deteriorated under the repeated attacks of the shivering fever. Physical weakness has undermined their spirit, and brought mental apathy and listlessness. Malaria has destroyed any sense of initiative, any interest in what lies outside the daily round.

It is exhausting to be always exhausted, depressing to be always depressed: people become resigned and regard their misfortunes as an inescapable heritage.

"But," says Dr. Emilio Pampana, who was WHO's first Director of Malaria Eradication, "as soon as malaria has disappeared, new settlers appear and begin to work the fertile land that was formerly uninhabitable. Their arrival acts like an injection of energy, a transfusion of new blood, on the unhappy populations who had clung to the malaria-infested land that no one ever thought of claiming from them.

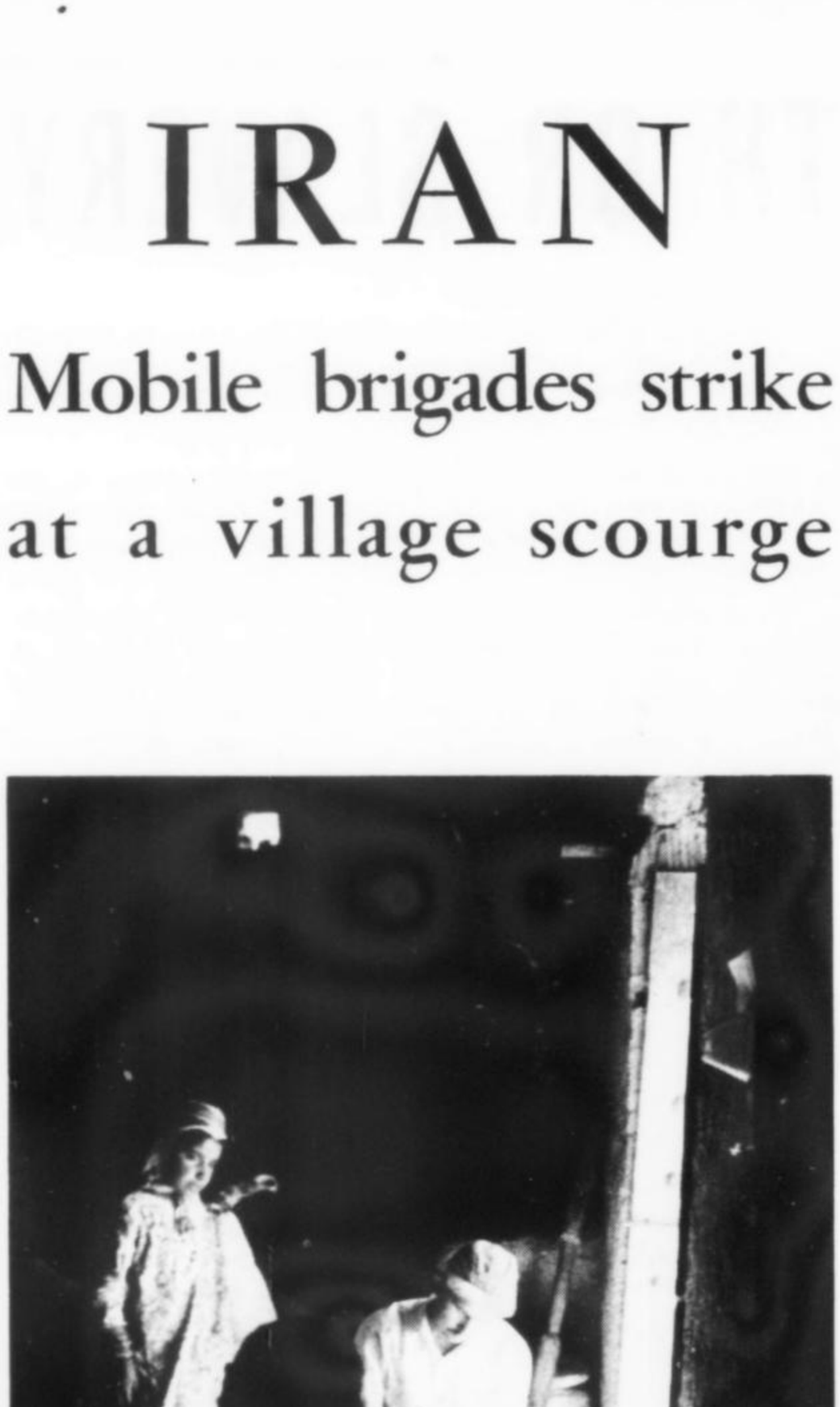
"Freed from malaria, the people begin to rediscover their strength, and regain their energy: they realise how much they have been deprived of, and demand something better. In short, they return again to life."

This was what happened in Sardinia, according to Dr. Paul F. Russell, a World Health Organization consultant who revisited that island after an interval of 20 years. "When I first visited the island in 1929," he says, I was distressed by the pitiable condition of many of the children in malarious villages. In a typical street there would almost always be sad little creatures with large bellies and pale faces sitting listlessly in the doorways of their homes. When I last visited Sardinia in 1950, after malaria had been eradicated, the village children everywhere seemed to be playing vigorously, kicking balls and romping about in a normal healthy manner, with rosy cheeks and without swollen bellies, a vivid and striking contrast that left no doubt in me about the beneficial effects of malaria eradication.

"In the same year I visited Oristano, in Western Sardinia. This marshy area had been so malarious that it gave rise to a local proverb: 'Chi va al Oristano resta al Oristano (Who goes to Oristano stays in Oristano)'. Here Mussolini carried out a huge 'bonification' that failed because the drainage did not stop malaria transmission; the land could not be profitably farmed because local and imported labourers rapidly became incapacitated by malaria. But in 1950, malaria had been eradicated and prosperous farmers were the rule in this area. In fact, later in the year I was told that the successful harvest had created several 'lire millionaires'. There was no room for doubt about the economic benefits of malaria eradication."

IRAN

Mobile brigades strike at a village scourge



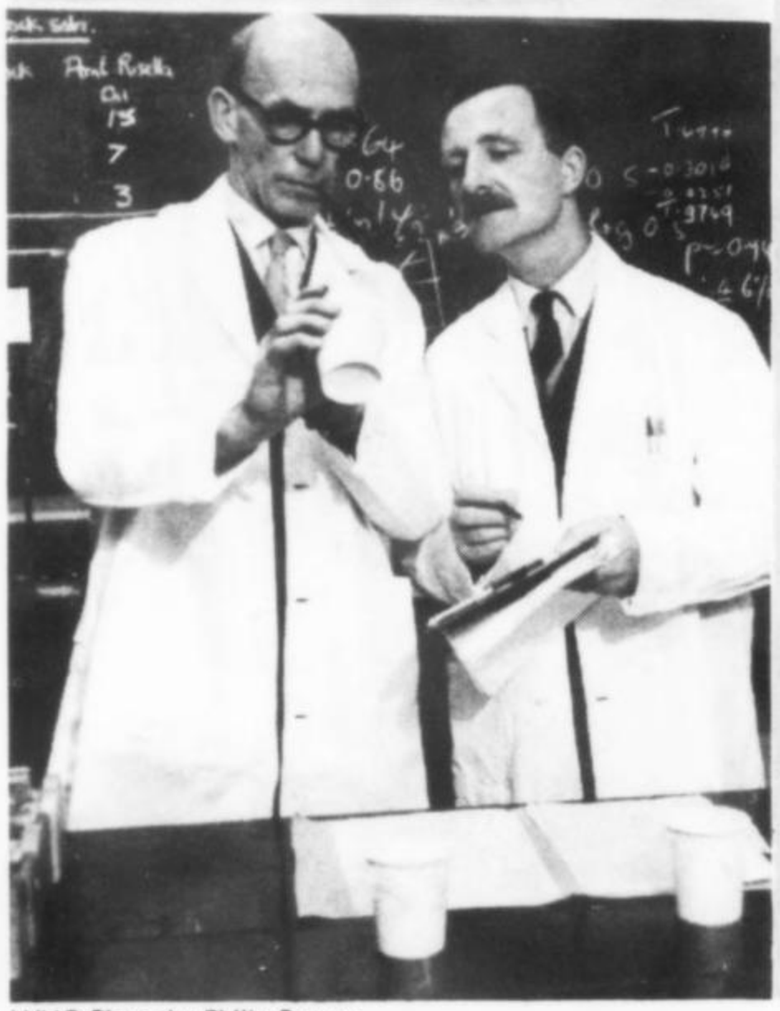
WHO Photos by Philip Boucat

The world malaria eradication campaign is based on the mosquito's habit of resting on interior walls after he has fed on someone's blood, and on the possibility of spraying those walls with "residual" insecticides that will kill most of the mosquitos settling on them over a period of several months. In this way, the chain of infection can be interrupted (the mosquito becomes infected by biting an infected person and passes on the disease by biting a healthy person). Above, member of a malaria eradication team working in Iran takes a mosquito from a wall which was sprayed with DDT insecticide ten days previously. The insect will be studied in the Kaserun Malaria Centre where research is being made into mosquito resistance to insecticides. Right, and above right, Iranians watch an anti-malaria team at work in their village.

CHILDREN ARE HARDEST HIT

Malaria strikes first at a country's most precious resource, its young children, and the disease is actually held responsible for 10% to 15% of infant mortality. Above, a boy of the Gourjii tribe in Iran, is examined by the visiting malaria specialist. Father and mother reassure their son; the doctor can make him well again. Below, the case of this little Iranian girl is recorded during campaign now in operation.

WHO Photos by Philip Boucas



WHO Photo by Philip Boucas

OUTWITTING THE WILY ANOPHELES

AT first sight, it seems like a straightforward fight between man and mosquito.

The female of the *Anopheles* mosquito bites a malaria sufferer and sucks up the malaria parasite together with his blood. Two weeks later she is able to pass on the infection by biting a healthy person.

To break the chain of infection, therefore, all that is needed is to kill the mosquito before the malaria parasite has had time to develop within its body and become a danger for the next person bitten.

The whole theory of malaria eradication is based on the mosquito's habit of resting on interior walls after it has fed on someone's blood, and on the possibility of spraying those walls with "residual" insecticides that will kill all the mosquitos settling on them over a period of several months. Yet in actual practice, unbelievably intricate problems arise.

★

THE world-wide campaign to stamp out malaria is aimed at protecting twelve hundred million human beings, widely different in their way of life and habits. The majority live in villages difficult to reach and far from any main roads. Such people regard as intruders those who come to spray the walls of their homes. In some places the houses have no walls, only a primitive roof. In others, the mosquito does not settle on the walls, but prefers to go and digest the blood of its victims in some outdoor retreat away from the houses. Elsewhere the mosquito bites only outside. It may happen that the mosquito is irritated by the presence of the insecticide and learns to avoid it, or else does not settle long enough for the poison to take effect.

A still more serious problem is that of resistance to the insecticide. It was this that prompted the decision of the WHO Member Governments at the Eighth World Health Assembly in Mexico City in 1955 to declare all-out war on malaria. It had become imperative to stamp out the disease from the world before all the species of malaria-carrying mosquitos would develop resistance to the insecticides used.

Almost everywhere until then, the fight against malaria had been carried on in a spirit of optimism. The spraying of the inside walls of houses with insecticides went on without undue haste; when one village had been done, the workers moved on to the next. More and more districts were gradually being protected against the disease. The work went on, slowly but steadily, the idea being that with perseverance and plenty of time it would sooner or later be possible to treat all the malarial regions of the earth.

It was in 1951 that the cry of alarm first went up: "The insecticide we are using is no longer active!" This was the first counter-attack; the mosquito was putting up resistance. At first resistance was assumed to be the result of the mosquito becoming accustomed to the insecticide as is the case with alcoholics or drug-addicts whose intake of alcohol or drugs is constantly increasing and yet produces less and less effect. The mosquitos too, seemed to become inured to bigger doses of insecticide, which at last failed to kill them. They appeared to have "acquired" immunity.

Out of this situation was born the idea of world-wide malaria eradication. It was decided to replace piecemeal campaigns by total war. The operation, it was realized, must be completed while the insecticide continued to kill and before the hitherto sporadic resistance became general.

This resistance was believed to be due to spraying at insufficient strength, thus giving the mosquitos a chance to grow accustomed to the insecticide. The essence of the eradication policy was therefore to make an all-out effort to engage in mass slaughter of the malaria-carrying mosquitos for the length of time required to cure the existing malaria victims and eliminate the infection. After that, even if the mosquitos came back, there would no longer be any infection for them to spread.

If the idea had ever been entertained that it might be possible to eliminate once and for all the malaria-carrying species of mosquitos, it was now abandoned. The mosquito had given its answer.

Then it was the turn of the entomologists, the geneticists, and the biochemists to launch their counter-attack, and this time the battle was engaged in the calm atmosphere of the laboratories.

Mosquitos take very kindly to life in confinement. From all over the world, mosquito eggs, tiny grey specks, are sent by post in boxes or in ordinary envelopes, to the famous Ross Institute of Tropical Medicine in London. Twenty-four hours later the eggs hatch out, and the wriggling larvae that emerge are fed, one item of their diet being baby-food in powder form, the same that builds bonny British babies.

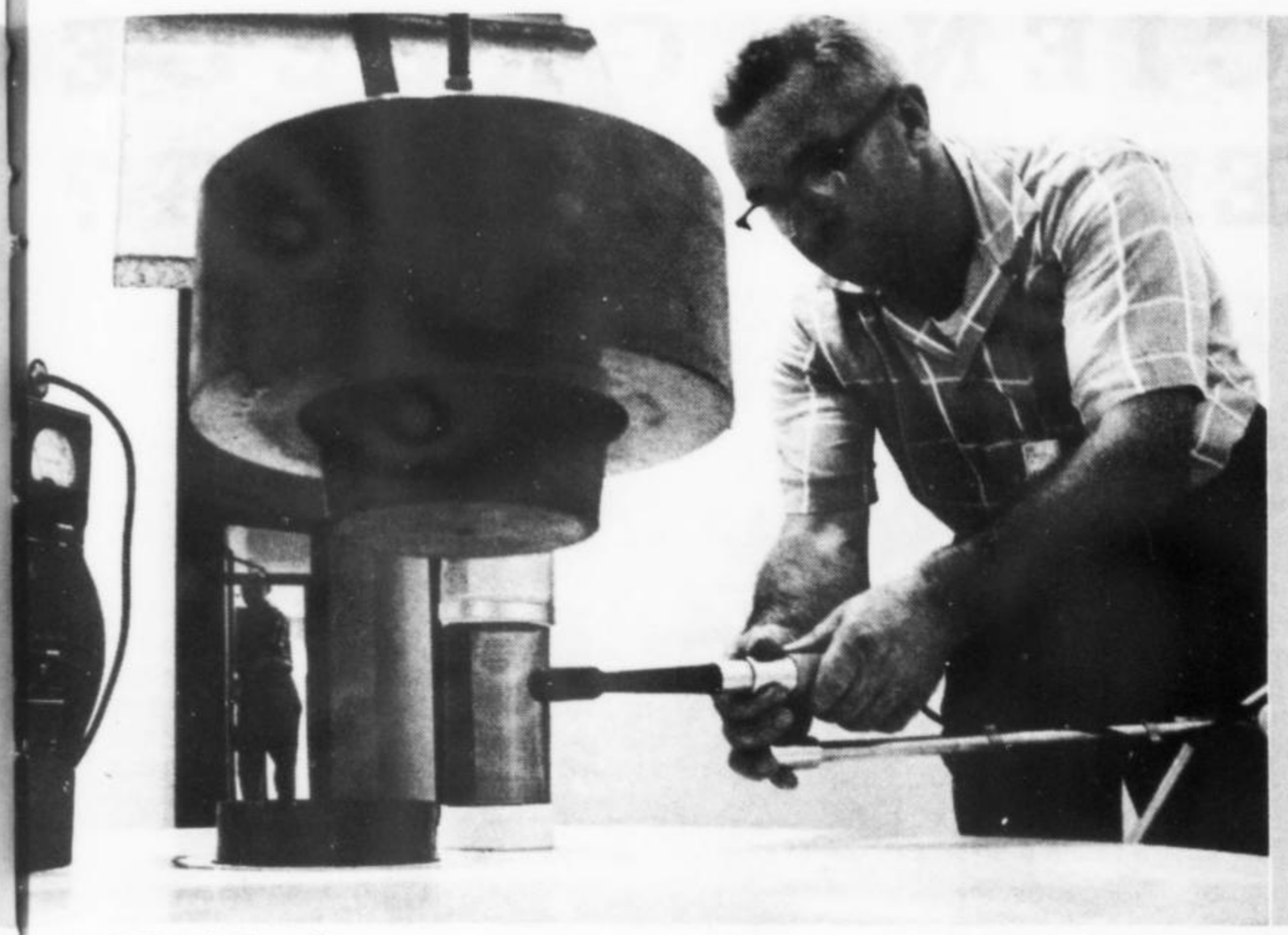
In a week's time the adults begin to fly, in cages of very fine netting. The males are fed on sugar, the females on blood which is sometimes taken from an entomologist's forearm but more frequently from the shaved belly of a guinea-pig. The mosquitos are then exposed to insecticides, and those that resist are separated from those that do not. The next step is mating: "resisters" are mated with "resisters", "non-resisters" with "non-resisters", and then "resisters" with "non-resisters". Some species of mosquitos refuse to mate in captivity, and for them a few entomologists have succeeded in carrying out artificial insemination.

★

FROM these couples come new families, which may be resisters, non-resisters or hybrids, each reacting in their own way to the various insecticides to which they are exposed. Scores of generations are studied in this way, and their behaviour is carefully noted.

This patient, meticulous research work has made it possible for entomologists and geneticists to determine with some accuracy the nature of this phenomenon of resistance.

Mosquitos do not acquire resistance, they are born with it; in fact it can now be affirmed that even before the residual insecticides were invented, some individual mosquitos were already "resisters". They had in them the genes of resistance, and were protected even against insecticides that were still in the future.



WHO Photo by Homer Page

In the all-out war to kill off malaria-bearing mosquitos, entomologists, geneticists and biochemists are helping to launch a counter-attack to the resistance which mosquitos are showing to insecticides. Far left, in the Ross Institute of Tropical Medicine, London, mosquitos are exposed to insecticides, their resistance is studied and new generations are bred for further research. Left, in Communicable Disease Centre of U.S. Public Health Service, insects are exposed to radiation beams from Cobalt 60 Chamber during similar studies. Such patient, meticulous research work helps to determine the nature of the mosquitos' resistance. Below, in a Philippines village, health team prepares to spray walls of houses where mosquitos settle after feeding.

WHO

It has now been established beyond doubt that at first the insecticide killed off the susceptible mosquitos. The remainder, the resisters, all survived and multiplied, producing a whole new population of mosquitos gradually less and less affected by the lethal properties of the insecticide.

★

THE scientists then set about finding out something more about the mechanism of resistance. In the case of a particular insecticide they discovered that, fortunately for the mosquito and unfortunately for us, its organism contains an enzyme which sets about altering the chemical composition of the insecticide by dissociating the atoms which make the substance toxic. The insecticide manufacturers were informed of this discovery, and their chemists are now trying to develop an insecticide which will become more effective when acted upon by the enzyme in the mosquito's organism.

There are unfortunately other insecticide troubles besides mosquito resistance. For instance the walls to be sprayed may interfere with the action of the insecticide. There are walls which soak up the insecticide and prevent it from doing its lethal work, and there are walls which decompose it and render it harmless. Then there is the good housewife, anxious to keep her house clean, who whitewashes or papers her walls, thus covering up the insecticide.

All these factors have to be taken carefully into account in organizing a world antimalaria campaign. Every detail must be watched and every eventuality guarded against. This calls for a thorough knowledge of the mosquito and its reactions to the various insecticides, a careful choice of the insecticide to be used, the precise determination of the dosage required, and so on.

The results of laboratory research should make it possible to get round most of these difficulties. By careful preliminary studies costly mistakes can be avoided and the road can be smoothed towards final eradication.

WAS ANCIENT GREECE VANQUISHED BY MALARIA?

WHO photo by K. Rafaelidis

Only when the last case has been tracked down and treated and the possibility of infection has ceased to exist will the earth be truly rid of malaria. Migrants, who are counted in millions, present a tricky problem. If they carry the malaria parasite in their bloodstream they may reinfect areas that have been cleared. Above, a some of the dwellers in nomad encampment near Skala, Greece.

WAS the real enemy which caused the fall of ancient Greece the malaria mosquito, whose ravages so weakened the country's inhabitants that its frontiers were left defenceless in the face of threatening enemies? This is a hypothesis of Professor G.D. Belios, head of Greece's antimalaria services.

"Greece has been a prey to the disease for more than two thousand years," he says, "and it has left deep scars on the country.

"If we read the legends of Hercules, we find references to schemes of land improvement through the draining of marshes. For instance, there was the Hydra of the Lernaean marshes which worked havoc among the population and the flocks. Again, Hercules succeeded in cleaning the Augean stables by changing the course of a river.

"Nevertheless, malaria was less prevalent in ancient Greece than it was just before modern eradication campaigns were launched. Changes have occurred in geographical and probably also meteorological conditions. The forests were much more extensive and the mountain slopes were not as naked and barren as they look today; the ground was more evenly watered, heavy rains did not produce raging torrents, the temperature was less variable, the land was extensively cultivated and waterworks had been constructed. Finally, the rules of hygiene that were strictly observed in the Greece of those days helped to keep the inhabitants in good health."

Professor Belios thinks it conceivable, however, that malaria ultimately weakened the resistance of the soldiers of ancient Greece, so that her frontiers were laid open to the invader. Her institutions collapsed, the waterworks fell into ruin, agriculture was neglected, and the fertile plains gradually changed into barren wastes, until at last the country which had led the world was plunged into long centuries of darkness.

1938 : 1 million cases
1958 : twelve hundred

GREECE, once the most malaria-ridden country in Europe, is today an advance post in the world war against this disease. It was the scene of the first internationally-supported large-scale operations involving the use of the all-powerful DDT. From Greece came the first proof that the interruption of spraying operations did not necessarily mean that malaria would reoccupy the land. It was also in Greece that resistance to insecticides was first observed in mosquitos.

"In 1938 we had nearly a million cases of malaria, and ten thousand people died of the disease; in 1958 we had twelve hundred cases and not a single death, although

our population has increased by two million", says Professor Belios.

"Between 1930 and 1938, malaria was costing us fifty million dollars a year in working days lost, hospital expenses, drugs—at that time we were importing thirty tons of quinine a year. At present our antimalaria services do not cost more than eight hundred thousand dollars yearly.

"Greece's national income showed an increase of more than 75 per cent over the years 1950 to 1956, and although the successful antimalaria drive is not the only reason it has certainly been an important factor.

"The virtual disappearance of malaria has had a considerable effect on the general mortality rate in Greece, which is seven per thousand today as compared with seventeen per thousand in 1921. Infant mortality has dropped from 135 per thousand in 1931 to 40 today.

"The average height of our recruits nowadays is 4 to 5 centimetres above what it was twenty years ago."

The campaign against malaria in Greece was launched with a great flourish in 1946. While vast areas of marsh and ricefields were being systematically covered with larvicide sprayed from 17 aeroplanes, antimalaria squads were visiting some 5,000 out of the country's 11,000 villages to treat the insides of the houses with insecticides. Mosquitos, flies, fleas, bugs and lice died off as if by magic. There was a marked drop in the number of cases of dysentery, a disease often spread by flies. Where fields of olive trees had been sprayed with insecticides from the air, the year's crop showed a 25 per cent. increase.

"Our wildest dreams were coming true before our eyes", says Professor Belios. "It was more than we had ever dared to hope for. But in 1951 it became difficult to obtain the insecticide, mainly because of the Korean war, and we had to discontinue spraying."

It was this combination of circumstances which led to the discovery that stopping insecticide spraying did not necessarily mean the return of malaria. Greece was to serve as a precious example five years later when the principles of malaria eradication were laid down, comprising two main stages: an all-out attack on the mosquitos that carry the disease, and then consolidation through systematic tracking down of the remaining cases.

Laughter in the village and money in the bank

TODAY malaria has been practically driven out of Greece, so effective are the operations of the country's antimalaria service, both on the mainland and on the countless islands of the archipelago. Case-spotting teams are doing house-to-house visiting in thousands of village, while private practitioners, teachers, mayors and priests regard it as their duty to report suspected cases. The Ministry's 1,100 rural and communal dispensaries also play their part. All patients admitted to hospital undergo routine blood tests, and twenty-four laboratories are devoting all their time to blood testing. Insecticide spraying has been reduced to an absolute minimum.

That is how Greece has almost rid herself of a scourge which has had a tragic influence on her destiny.

Nowadays in the southern Peloponnese there are great rice plantations and the cotton fields at Skala are vast. Only ten years ago half this land lay fallow, and malaria was general. Now at harvest time the village streets are alive with laughter and high spirits, the bank stays open day and night to pay for the crops, and there is a big fair in the olive groves to which the country people come to lay in their winter supplies.

In 1959 there was only one case of malaria in the whole of the Skala district, a soldier back from military service

© F. Barzilay

Once the most malaria-ridden country in Europe, Greece is today an advance post in the world war against this disease. After being a prey to malaria for more than 2,000 years, Greece is now virtually rid of the scourge. But case-spotting teams still do house-to-house visits in thousands of villages like the one shown here, and over 1,100 rural and communal dispensaries play their part in the complete eradication of malaria from the country.

who had somehow slipped through the malaria defence network. The antimalaria service is very much on the alert at Skala. Since spraying operations finished, the mosquitos have come back in the same numbers as before, ready to act as carriers of any malaria that may appear. The greatest care is therefore necessary.

It was at Skala, too, and in Nauplia a little further north, that mosquito resistance to insecticides appeared for the very first time. This was in October 1951 when spraying was still going on; mosquitos began to be seen again in the houses, and the country folk blamed the spraying teams for not doing their work properly.

While on a visit to London, Professor Belios went to see the experts at the Ross Institute, but they at first refused to believe that the insecticide had ceased to act. The facts soon compelled them to admit that the Greek mosquitos had won a real victory. Fortunately it proved possible to replace the insecticide by others which were still effective for a certain period. Then followed the attack on the malaria parasite by tracking down and treating the remaining sick people.

Since that October day in 1951 some 19 species of malaria-carrying mosquitos in different parts of the world have developed resistance to one or other of the insecticides used. Up to now, however, only three species have proved resistant, to a greater or lesser degree, to all the insecticides that can be used in the world campaign against malaria.

Since October 1951, laboratory research has been speeded up so that before launching an eradication campaign, antimalaria services can obtain accurate information as to how their enemies, the mosquitos, will react to the insecticides that are to be used against them.

Photos © F. Barzilay

With the virtual disappearance of malaria there has been a vast improvement in the life of people in the Greek countryside. In some areas there are now great rice plantations and vast cotton fields where only ten years ago half the land lay fallow, and malaria was general—one million cases in 1938. The country's general mortality rate has dropped by nearly two-thirds as compared with 1921; it was then 17 per 1,000.

THE GOAL FOR EUROPE: MALARIA OUSTED BY 1962

IN Europe, does malaria still matter? It this not one of those outmoded diseases long banished from the continent? In a good many countries it is true that malaria has been driven out, in some at great cost. The honours list includes Italy, the Netherlands, France, Hungary, Poland, Czechoslovakia, the Ukraine and Byelorussia.

Around the shores of the Mediterranean, the battle is still sharply contested. Eleven countries in the European Region of WHO, which includes Morocco, Algeria and Turkey, are still in varying degrees infested with malaria. A severe problem is faced in the three countries named where great efforts will be needed to get rid of the infection. On the European continent, the situation is more favourable: it is expected that by 1962 malaria will have disappeared for good.

As little as a decade ago, malaria still claimed hundreds of thousands of victims in certain areas where it had reigned supreme for centuries. In Rumania, Spain, Portugal, the Soviet Union, Greece and other countries, malariologists and the governments that supported their work are on the eve of a victory that will bring great benefit not only to the national populations but to Europe as a whole.

The matter is indeed one of concern to Europe, for both the mosquito that transmits malaria and the man who carries the malaria parasite in his blood can easily cross a national boundary and reintroduce the infection in areas laboriously cleared of it. This is one reason for pursuing the battle with vigour and ridding the continent in its entirety of the danger as soon as possible.

Mopping up the last cases is the task facing European malaria workers today.

U.S.S.R. SEES VICTORY AHEAD IN 40 YEAR WAR ON MALARIA

by L. J. Bruce-Chwatt

DURING the nineteenth century and the early part of the twentieth, malaria was one of the main endemic diseases in Russia, occurring throughout the country but being particularly prevalent in the Caucasus, in Transcaucasia, in Central Asia, and along the lower Volga. The annual mortality in the garrisons stationed during the latter part of the nineteenth century along the northern shore of the Black Sea and near the Persian frontier amounted to as much as 25 %. It was estimated that 5,000,000 people were affected annually in the years 1890-1900, and at least 3,500,000 during World War I.

In the wake of that war, the huge movements of population that took place, and the general lowering of economic and social standards, led to the greatest malaria epidemic of modern times in Europe, which ravaged a large part of the U.S.S.R. in 1922-1923. There were 600,000 fatal cases of malaria in each year, and in parts of Central Asia, the Caucasus and the Volga basin 75-100 % of the population were infected. One report claimed that not less than 12,000,000 cases were involved.

In the early twenties an Institute of Protozoology and Chemotherapy (now the Institute of Malaria, Medical Parasitology, and Helminthology) was set up in Moscow, and rural antimalaria stations were created in growing numbers. By 1930 the situation had improved: public health measures in general, and malaria control in particular, were more widely undertaken and better executed, and institutes of tropical medicine had been established in a number of places.

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APART from 1934-1936, when there was a temporary increase especially in Central Asia and the Caucasus, the morbidity rate for Malaria fell gradually year by year, until in 1939 it was the lowest that had ever been recorded in the U.S.S.R. The Second World War caused a temporary setback; there was, almost inevitably, a great increase in the number of cases in the devastated areas, particularly in the Ukraine and Byelorussia.

In the post-war years public health services were reorganized and malaria control tightened up. In 1951 a national antimalaria programme was included in the Five-Year Plan, with striking results: whereas in 1952 the number of cases of malaria in the U.S.S.R. had been 183,603, in 1958 it was 4,678. In 1952 the concept of elimination of malaria as a mass disease was adopted, and by 1955 it had become obvious that total eradication could be achieved by 1960.

The comprehensive programme for the elimination of malaria as a mass disease from the U.S.S.R. has been carried out with an impressive drive and determination that could not have been possible without adequate medical, scientific, and auxiliary personnel. In 1956 no less than 2,780,000 persons, or about 1.3 % of the entire population, worked in one capacity or another in the field of public health; there was therefore no shortage of staff for malaria elimination.

From the outset the programme was based on the existing wide network of dispensaries, health centres, polyclinics, and the like. Notification of cases of malaria had been compulsory in some parts of the country ever since 1921. It was extended to other areas in 1947-1948, and registration of cases, made on a much more stringent procedure, has covered the entire country since 1951.

A comprehensive training programme was put into effect. In addition to chemiotherapy and spraying, other available methods of control were pressed into use, technical guidance being given by the Moscow Institute of Malaria, Medical Parasitology, and Helminthology and by the regional institutes. An outstanding characteristic of the whole programme is the careful planning of antimalaria measures in relation to both general and specific economic and social development. Public health education has received much emphasis, and is carried out by meetings, discussions groups, pamphlets, posters and films.

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ON the basis of general directives sent out by the Ministry of Health, the planning of antimalaria measures within each district is done by the district medical unit, with the advice of the corresponding health centre.

The medical follow-up and drug administration are carried out by the hospitals, polyclinics, dispensaries and other health units. Small-scale insecticidal measures are carried out by local health units, with the co-operation of other health organizations if necessary. Large-scale spraying is always done by the district health centres.

Much attention is paid to the blood examination of all fever cases reporting for medical attention. Medical and paramedical personnel are often reminded of the possibility of malaria in cases of obscure fever, and the population is encouraged to go to medical aid centres for the diagnosis and treatment of even minor aliments. All overt cases of malaria and all persons found to be positive for malaria are registered. These registrations are sent monthly to the provincial health authority.

In addition to passive surveillance of this kind, there is active surveillance during the transmission season in all areas where malaria used to be common. It is carried out by district health visitors or voluntary drug distributors, visits being made every five or ten days, according to the size of the district. All local inhabitants or visitors with fever or vague general symptoms have their blood examined for malaria parasites, but no immediate treatment is given.

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THIS work is often carried out by non-medical personnel, such as members of the Red Cross. Mass surveys of the population are also occasionally carried out. Some surveys cover individuals who are known to have had malaria during previous years, who have had undiagnosed fevers, or have come from malarious areas; but in smaller localities the whole population is examined.

The results of this intensive programme have been spectacular. In the largest administrative unit, the Russian Socialist Federated Soviet Republic, the trend of morbidity can be assessed by taking the 1940 figures as 100 %. After a peak of 103 % in 1945, the percentage fell to 55 in 1948, to 42 in 1949, to 19 in 1950, to 8 in 1951, to 4 in 1952, to 1.5 in 1954, and to 0.25 in 1956.

According to recent information supplied to WHO, the total number of cases of malaria in the U.S.S.R. was 5,097

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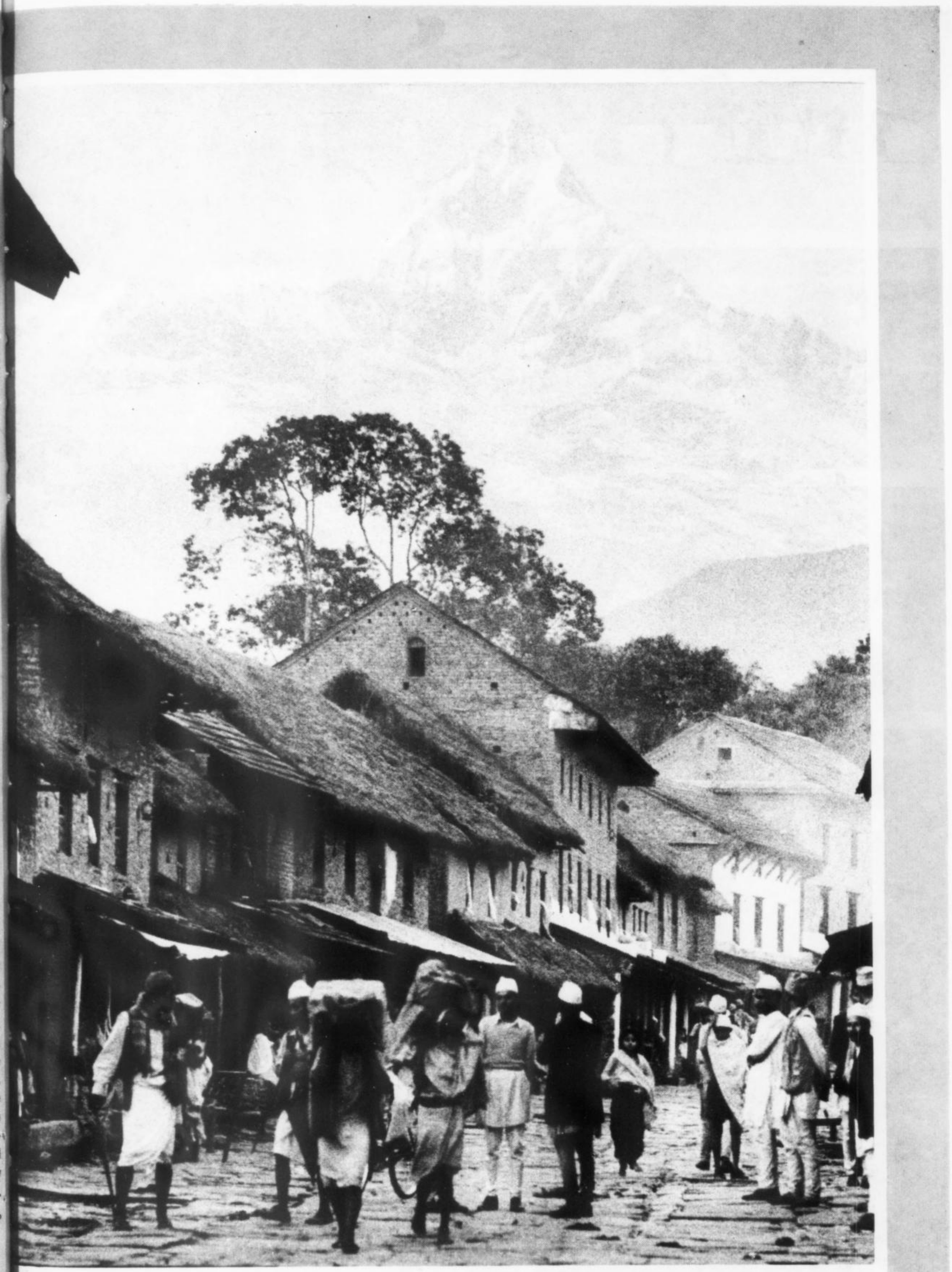
This account of malaria eradication in the U.S.S.R. is condensed from an article by Dr. Bruce-Chwatt, Chief, Planning, Division of Malaria Eradication, W.H.O., which appeared in the "Bulletin of the World Health Organization".

MALARIA PATROL AT THE FOOT OF ANAPURNA

World Health Organization expert, T.S. MacInnes, sets out on a ten-day march through the Himalayan foothills to organize supply lines for Nepal's malaria eradication campaign. His reconnaissance trek begins in the village of Pokhra (right) in the shadow of giant Mount Anapurna. With village leaders (above left) he discusses the forthcoming campaign and arranges storage space for medical supplies. Mealtime halts (left) find MacInnes and his party surrounded by a fascinated audience of youngsters.

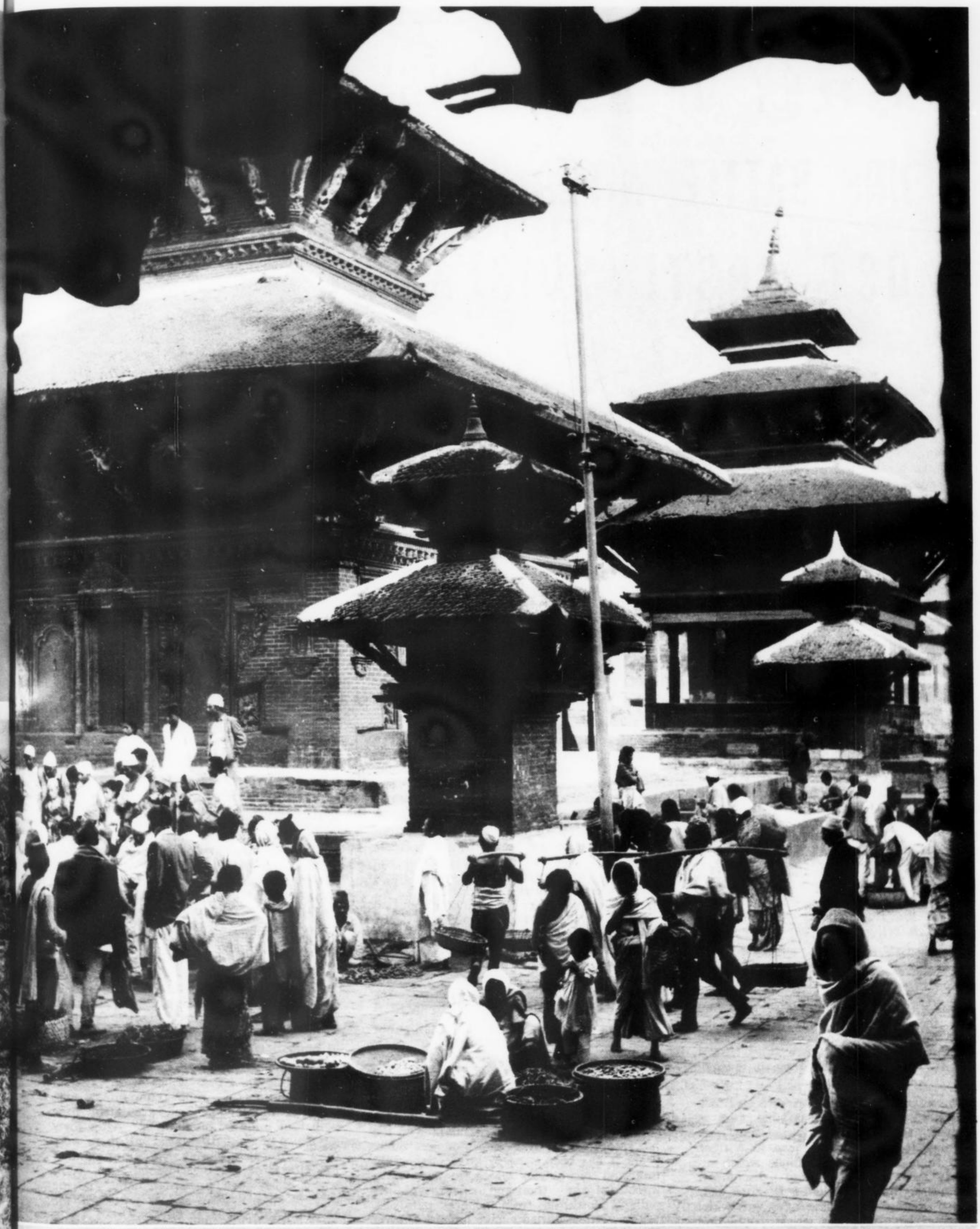
WHO Photos by Eric Schwab



MALARIA PATROL

(Continued)

From the aerodrome at Pokhra, MacInnes's team and its porters set out through the local rice fields and cross one of the swiftly-flowing rivers that race out of the foothills (photos left). Below, during its 150-mile march to Khatmandu, the heavily-laden party approaches some of the terraced cultivation strips of a Nepalese village.



WHO Photos by Eric Schwab

JOURNEY'S END. A busy scene outside the temple of Hanuman Doka, in Khatmandu, capital of Nepal. Here MacInnes reported on his mission to the H. Q. of the Nepal Malaria Eradication Organization. During his trek he was able to brief village social workers and education officers on the campaign.

BATTERY OF NEW DRUGS JOINS BATTLE WITH WORLD'S MOST COSTLY DISEASE

WHO photo by Paul Almasy

In a village in Liberia, the doctor has discovered many malaria cases and is distributing anti-malaria pills which children and grown-ups obediently swallow on the spot.

THERE is a whole battery of drugs against malaria. Some are preventive drugs, taken as a protective measure by visitors to malarious regions, and some are effective in treating malaria sufferers.

One might then ask whether the present campaign for the eradication of malaria is on the right lines with its complicated insecticide spraying operations, its delicate laboratory work, the enormous transport problem involved, and the costly army of workers needed.

Would it not be simpler to distribute drugs to everyone living in malarious areas? In this way malaria sufferers would be cured and others protected. "No", say the experts.

In the first place, the experts say that the antimalarial drugs only keep the blood parasite at bay for a short time; scarcely one week, in fact. This means that an immense and very efficient organization would be needed for the regular distribution of drugs over vast territories with widely-scattered, and often nomadic, inhabitants. Then the population would soon tire of coming so often for treatment.

Nevertheless, the antimalarial drugs play an extremely important and indeed essential role in the eradication campaign, particularly in the final phases when the last foci of infection must be mopped up.

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HERE again a problem arises that only the laboratories can solve. They must try to produce a drug which maintains its efficacy for a long enough period and which can be given in a single dose at long intervals.

The scientists are therefore directing their efforts to finding a drug that can be injected. One advantage is that some people may feel more confidence in a treatment that hurts than in tablets which are merely swallowed without discomfort. Another is that an injection is more difficult to evade during mass campaigns which systematically treat the whole population.

For centuries, powdered cinchona bark (which became quinine) was used to cure malaria.

The discovery of modern antimalarial drugs was an indirect consequence of the two world wars. The first synthetic products were obtained in the laboratory between 1924 and 1927 by the Germans who had been working on the problem since their quinine supplies were cut off by the war. From 1939 to 1945 it was the Allies who manufactured products to replace the cinchona bark which no longer arrived from Japanese-occupied Java.

Through a strange series of coincidences in the inter-war period, research work on synthetic antimalarials opened the way to further progress in two apparently unrelated fields: the behaviour of the malaria parasite in the human organism, and the treatment of syphilitic nervous disorders.

In order to test the effectiveness of the new drugs, European research workers needed malaria patients. These were rare in Europe and—understandably— the few attending a hospital preferred to be given treatment rather than be used as guinea-pigs. The solution was to find people willing to be inoculated with malaria. The neuro-syphilitic cases provided the answer.

This story goes back to the time of Hippocrates who, five centuries before Christ, recognized that violent fevers sometimes had a beneficial effect on sufferers from certain diseases. Galen, seven centuries later, described the cure of an epileptic after an attack of quartan fever. In the nineteenth century, some observers found that certain mental patients were returned to sanity after an access of fever (malaria, typhoid fever). In 1917, an Austrian psychiatrist for the first time inoculated malaria into nine patients suffering from general paralysis, and cured three.

It was in England that an Indian sailor from Madagascar disembarked in 1925, shivering with malaria, and went for treatment to the Horton Hospital, Epsom. He was treated, but a little of his blood infected with the malaria parasite, *Plasmodium vivax,* was carefully preserved. This strain of the parasite was maintained in the laboratory, and over a period of thirty years it has been used to infect sixty-eight thousand mosquitos, which in turn have infected ten thousand neurosyphilitic patients suffering from general paralysis. Many of these patients have left the Horton Hospital, cured. The others, by consenting to be first infected with and then cured of malaria, have made it possible to determine the limitations of quinine, to test certain modern drugs and, finally, to establish the fact the liver plays an important rôle in the development of the malaria parasite.

With the discovery of penicillin, the queen of all drugs against syphilis, cases of general paralysis have almost disappeared and consequently there is no further need for malaria therapy of neurosyphilitic cases, and the antimalarial drugs can no longer be tested in this way.

Nevertheless, some experiments with these drugs are still continuing with the help of human volunteers, particularly in Italy, Rumania and the United States.

Although control of malaria with drugs alone has not been found practicable in most of the territories in which eradication campaigns are being conducted, quite a new method is being employed in Brazil.

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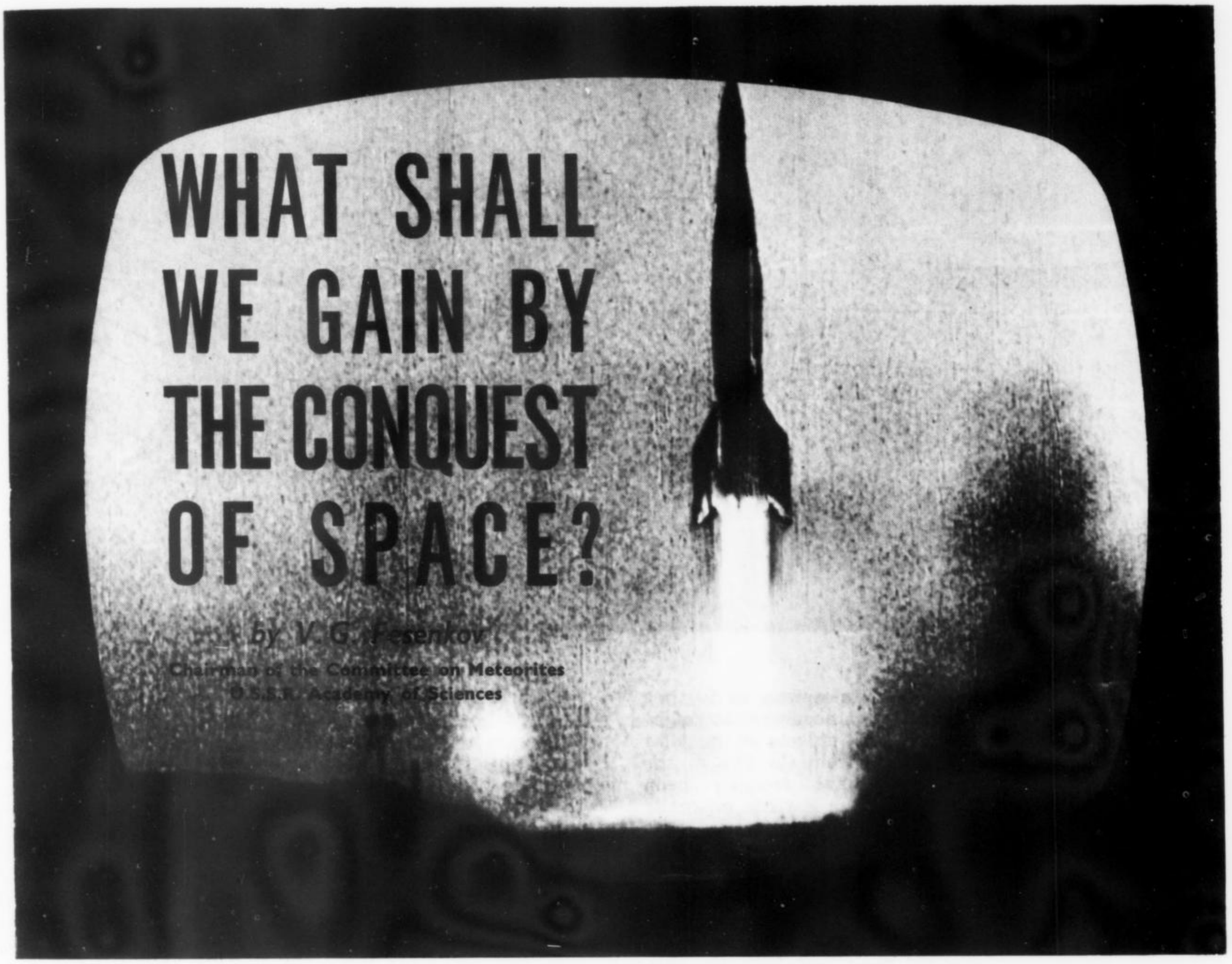
THE Brazilian eradication campaign was making slow progress in the vast, impenetrable forests of the Amazon basin. Three million people live there under the menace of malaria. Most of their houses have no walls and consist only of a roof over four supports. The mosquitos, after biting, go outside in the open to rest. Many nomads move about the country according to season and availability of agricultural work. Spraying offers therefore little chance of interrupting transmission of the disease.

A Brazilian specialist, Dr. Mario Pinotti, conceived the idea of adding an antimalarial drug to the cooking salt used at every meal by the people of the Amazon zone—in the same way as iodine is added to the salt in regions where goitre is present in endemic form.

The first experiment was made in the State of Para. Two zones were created: an experimental zone containing nine hundred inhabitants, and a control zone with four hundred inhabitants. After forty days' use of the antimalarial salt there were only two cases among the nine hundred inhabitants of the experimental zone. One was a newly-born, breast-fed baby, and the other a stranger who had only been in the zone for the last three days.

In view of these results, the World Health Organization has asked scientists in the U.S.A. to do further research. WHO is also proposing to help several countries to try out this new method, which seems to promise good results in areas where classic spraying operations meet special difficulties.



WHAT SHALL WE GAIN BY THE CONQUEST OF SPACE?

by V. G. Fesenkov

Chairman of the Committee on Meteorites
U.S.S.R. Academy of Sciences

PEOPLE sometimes ask what purpose is served by launching rockets into outer space and how this can benefit mankind? The answers are that rocket flights have already helped to solve a host of scientific problems and are now throwing light on a number of questions still awaiting solution. Their greatest importance, however, lies in the magnificent prospects they open up for the future. That is why we feel justified in saying that the launching of space rockets opens up a new era in the history of man's conquest of outer space.

All our technical progress and all our civilization are, in general, closely bound up with our knowledge of natural laws, that is, laws governing the Universe that surrounds us. Natural laws cannot be adequately studied within the narrow walls of our laboratories. For their proper study we must get out into the boundless expanses of outer space. Atoms of matter are the same everywhere but their nature is infinite, with the manifestations depending on external conditions that can only be partly reproduced on Earth.

In outer space we find matter in states of great density and great dispersion. The average density of the white dwarf stars, for example, is ten thousand times that of water; such bodies may exist for thousands of millions of years. The density of interstellar space, on the contrary, is about thirty degrees of magnitude less, being about one atom to the cubic centimetre.

The temperature of the central regions of the Sun is about twenty million degrees; at such temperatures nuclear reactions are set off spontaneously and keep the Sun's radiation going. The temperature inside the giant red stars reaches thousands of millions of degrees and is appropriate for the formation of chemical elements heavier than hydrogen or helium. Material particles, the nuclei of elements, mainly of hydrogen, that constitute the streams of cosmic rays, are accelerated by the magnetic fields of our galaxy to velocities approaching that of light. All these processes take place in infinite space and have been going on for a period of time that is, for all practical purposes, also infinite.

We cannot understand the laws of nature and master her secrets if we do not study the entire Universe in all its more important manifestations. Nor can we properly understand the nature of our Earth if we do not compare it with related planets, even if only with those that constitute our own solar system.

So far the only bodies from outer space that have come into contact with Earth are those meteorites and perhaps remains of comet nuclei that have broken through our atmosphere and reached the Earth's surface without being fully destroyed. Even ordinary meteors are burned up in the upper layers of the atmosphere; we can only get a glimpse of other cosmic bodies at a distance of millions and millions of miles and, what is more, from the bottom of an ocean of air.

It is this atmospheric envelope around the Earth that hampers the study of the Universe. Constant atmospheric turbulences distort optic images and they blur to such an extent that really big magnifications cannot be employed. It has therefore been found possible to observe finer details of the structure of the solar surface by sending telescopes up in balloons, if only to a height of 6-10 miles, than it has been possible to do at terrestrial observatories, even those located high up in the mountains.

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CONQUEST OF SPACE

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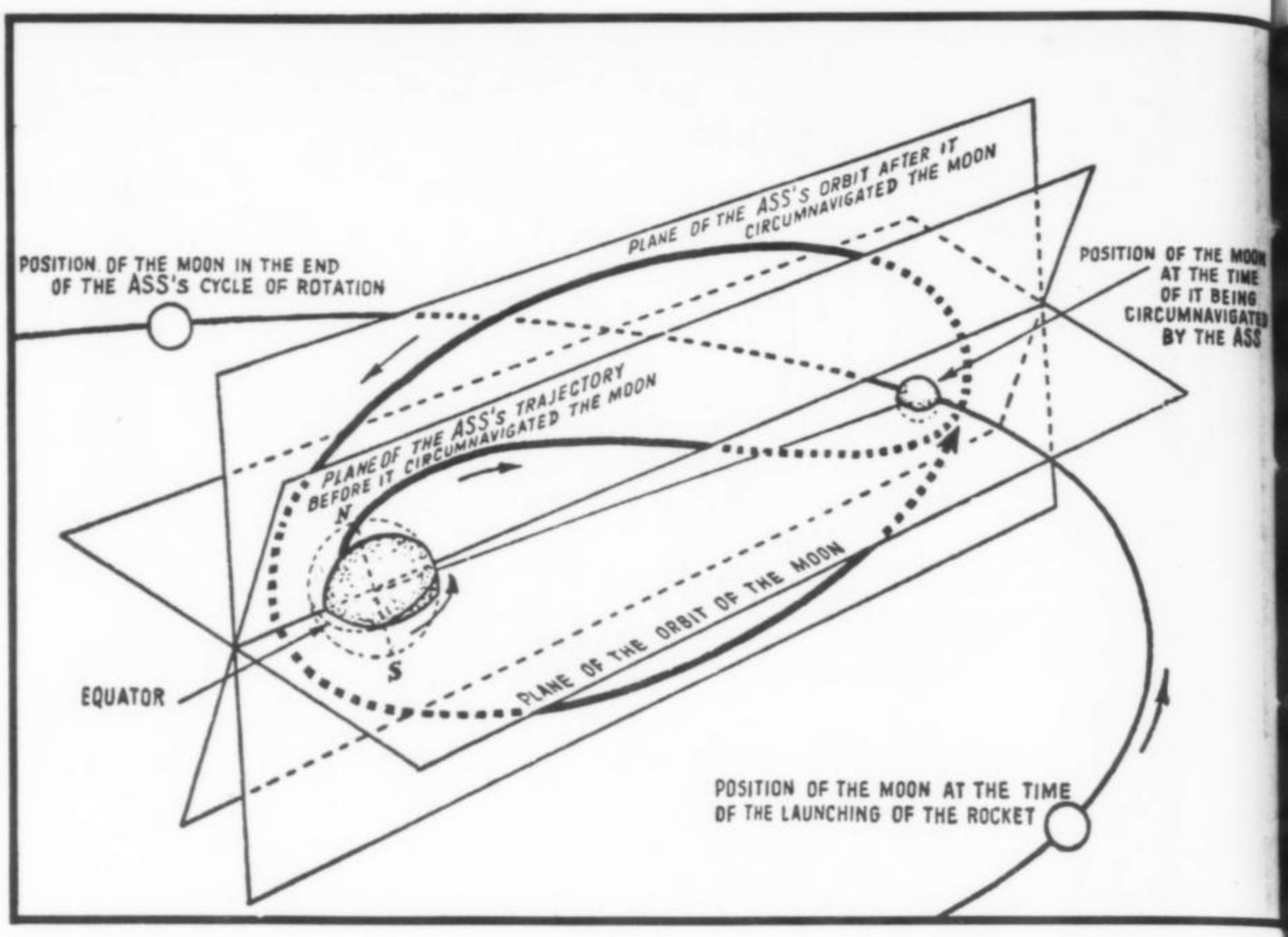


Launched on 4 october, 1959, a Soviet Automatic Space Station photographs the far side of the moon for the first time. Far right, Soviet vehicle at moment of taking photograph. On signal from Earth, gas jets stopped space station's spinning, lined it up with sun's rays (shown by arrows) and focused two lenses on moon. Exposed film was automatically developed. A scanner changed picture to electric pulses that were sent to Earth. Right, diagram of flight trajectory.

Official Soviet photos

The diffusion of sunlight in the atmosphere in daytime and the luminosity of the high ionosphere at night prevent the observation of such faint objects as the solar corona at a great enough distance from the Sun or the many indistinct nebulae that have recently been discovered by the use of rockets. The Earth's magnetic field prevents the penetration of primary cosmic rays from outer space and in places where they do break through they are fully absorbed by the upper layers of the atmosphere so that we can only observe their secondary effect.

It is equally true that the particularly active and, consequently, the most interesting radiations from the Sun and other cosmic bodies are completely absorbed by those upper layers of the atmosphere that affect them most strongly. Until recently it has been possible to observe the Universe from Earth only through a "window" limited to radiations to which the eye is receptive.

It is only during the past few decades that another "window" has been opened through which the much longer radio waves can be received. The most active cosmic radiations (which have the very shortest wavelengths) are still beyond the reach of direct observation however, because they are fully absorbed by the upper layers of the atmosphere.

All these difficulties disappear once we reach outer space. Imagine, for example, an astronomical observatory flying through space as an independent planet. It would be very easy for it to take samples of interplanetary matter. What does this matter consist of, what gases and dusts does it contain? Such a simple test would immediately solve the still disputed question of the sources supplying the interplanetary matter which appears to observers on Earth in the form of zodiacal light (1). If it is dust it may come from comets and, partially, from asteroids as the product of their constant disintegration and would indicate the intensity of that process. If it is gas it is emitted mainly from the solar atmosphere and characterises the corpuscular radiation of the Sun. The answers, obtained by a rocket observatory, will enable us to check up on our conceptions of the nature of interplanetary space and give them greater precision and, at the same time, to draw new conclusions on the processes that are going on within our solar system.

(1) *A tract of nebulous light sometimes visible before sunrise or after sunset extending along the zodiac on each side of the sun in the form of an elongated ellipse.*

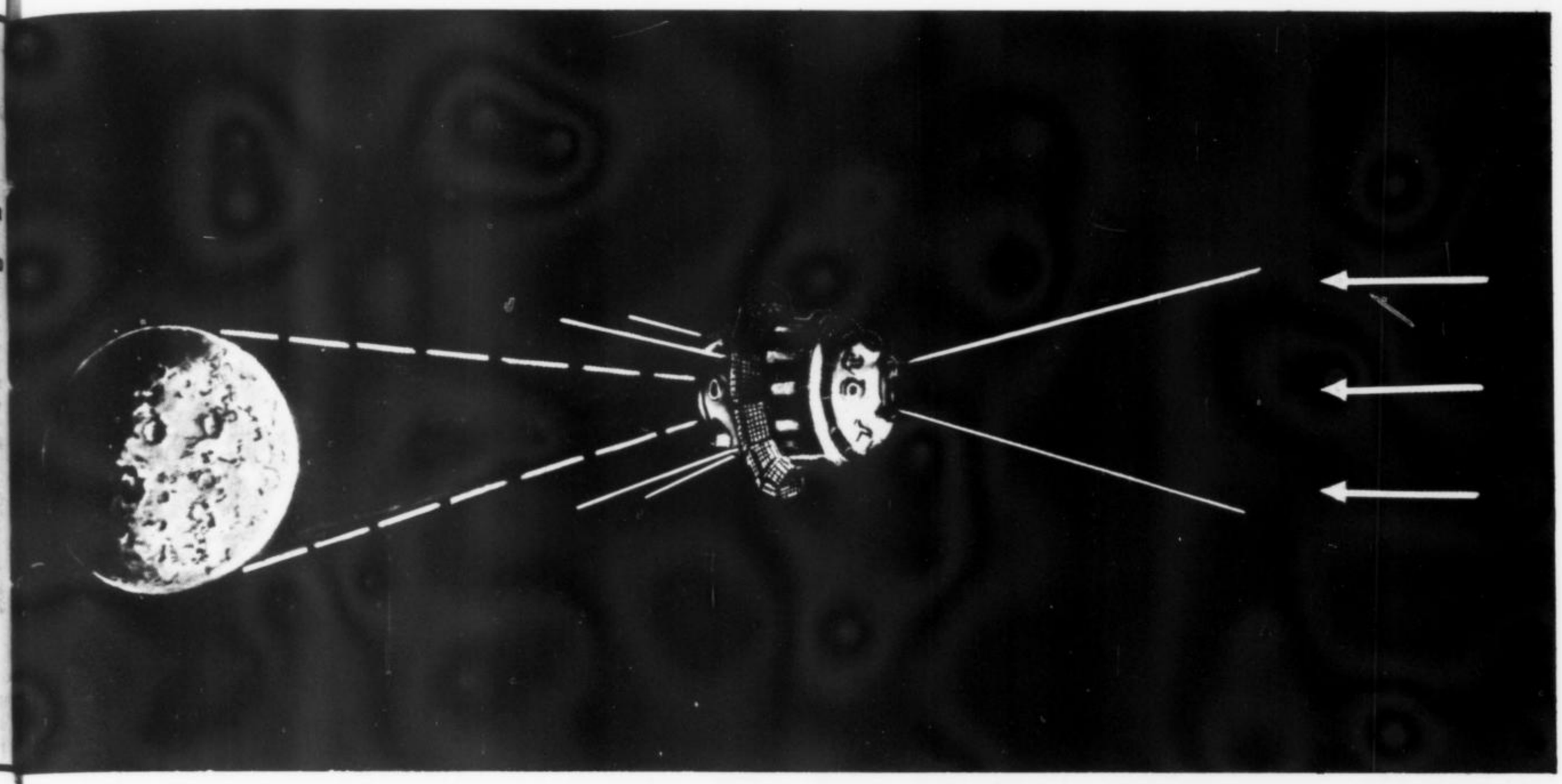
Even a simple glance at the Sun or a planet through a rocket telescope will tell us a great deal. We shall be able to see the long streams of the solar corona that at present can only be seen during a total eclipse and of which only the part closest to the Sun is visible at other times through a special instrument. Outside the atmosphere it will be possible to see, against the black background of space, how the corona gradually changes into zodiacal light and begins to spread out along the ecliptic. The aspect of the solar corona at various distances from the Sun's surface will enable us to judge the extent to which it is supplied with matter in the form of dust gathered from interplanetary space and to what extent it is made up of gases radiated from the Sun itself.

Space camera surveys the lunar 'seas'

A simple spectral photograph of the Sun's corona and other solar envelopes would enable us to register the basic radiations of hydrogen and espacially of other more heavy elements connected with transitions at the lowest energy levels, that are outside the range of observers on Earth. It is precisely these radiations, possible only at corona temperatures of several million degrees, that have the greatest effect on the upper layers of the atmosphere and condition their considerable extension and high temperature. The study of this solar radiation in the X-ray region of the spectrum will most likely enable us to understand the nature of the mechanism by which the Sun influences the Earth and also the mechanism by which the so-called "flares" and other solar phenomena arise; they are possibly connected with some nuclear reactions.

There is also very much that can be explained in the nature of the planets that form the solar system.

For the first time in history it has been proved possible to obtain a picture of the hidden side of the Moon and to transmit it back to Earth from a telephoto installation mounted on an automatic interplanetary station. The image so obtained is clear enough to show even such details as the central peaks inside the craters that have been named Lomonosov and Tsiolkovsky. This is an achievement that does credit to our scientists working in the field of electronics. Since the camera was between the Sun and the Moon at the time the photographs were taken, the relief of the lunar surface is not discernible.



The following features distinguish the hidden side from the earthward side of the Moon. On the earthward side many of the craters have bright rays running from them that are very distinct at full moon; those surrounding some of the craters are very extensive and clearly marked. They are always connected with the central peaks in the craters and, it is believed, with their former volcanic activity. Not a sign of any such formation is to be seen on the other side of the Moon.

The far side of the Moon also seems to be deficient in those dark patches that are called "seas" and this is very informative. The biggest of these "seas" on the earthward side is the *Oceanus Procellarum;* the surface directly opposite on the other side is bright and level with nothing on it resembling a "sea".

Such a great difference cannot be a matter of chance. It will be remembered that the Moon is not a perfect sphere: the earthward side is pulled outwards in the direction of our planet to a distance of several dozen kilometres as though it were formed by the hardening of a gigantic tidal wave. This makes it safe to assume that the thickness of the lunar crust varies in different parts of that body. It is of interest to connect this with the intensity of lunar volcanic processes, in particular with the process that gave rise to the lunar "seas". At a certain period in the Moon's development, when the craters and annular mountains had already taken shape, large areas of the surface were in a molten state and later hardened to form "seas" surrounded by high eruptive formations, the mountain ranges. On the hidden side of the Moon this process is scarcely noticeable.

A detailed study of this phenomenon will cast much new light on the development of the Moon's crust; it will also help towards a better understanding of the evolution of our planet.

It is rather difficult to give a list of the various problems that it will be possible to solve by the use of a space laboratory since its possibilities are immense. Here on Earth we usually have to employ telescopes with a magnification of no more than 300 to 400 diameters on account of the interference of the atmosphere. Even at the present level of optics it will be possible to make telescopes for a cosmic laboratory that have a magnification of tens of thousands of diameters ; this means, for example, that objects with dimensions of about ten metres will be clearly visible on the Moon. It follows from this that it will be possible to investigate the smallest features such as the crater mouths on the peaks in the centre of lunar ring formations.

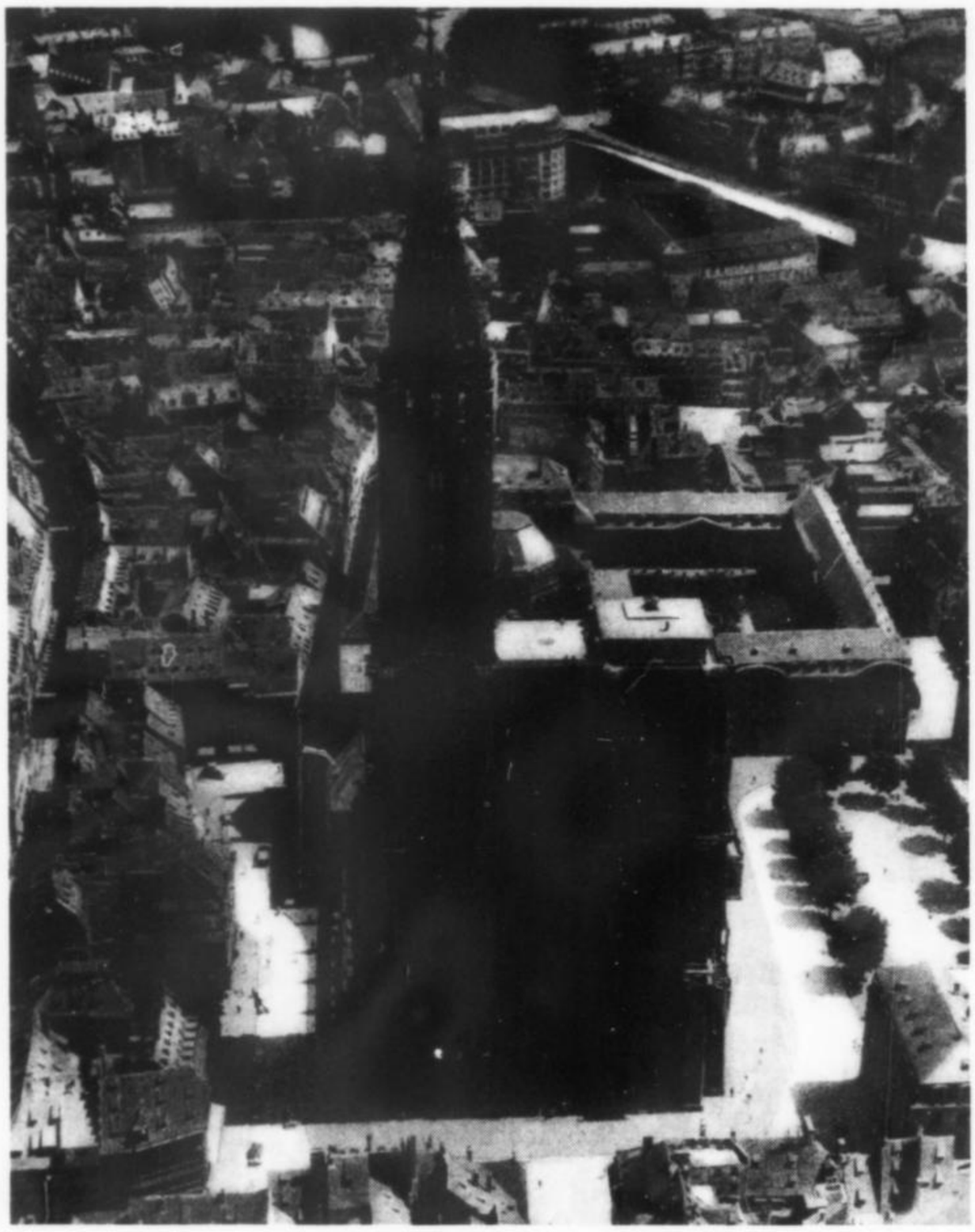
And how much that is new will be discovered by similar observations of other planets, especially Mars! Schiaparelli and Lovell, who made their observations at the turn of the century, worked under the best conditions available on Earth. They discovered the canals on Mars and believed them to be artificial engineering works. But there are no canals in the sense in which they understood them, and no regular formations of any sort on Mars. There is something else there, something connected with constant, systematic change. If a telescope a hundred times more powerful than those in use today could be turned on Mars many new facts concerning that planet would come to light.

Will man migrate to distant worlds?

EVEN a simple photograph of Mars's spectrum simultaneously in its infra-red and ultra-violet regions will provide an ultimate solution to the problem of whether oxygen is present or not. This may be proved by studying the ozone bands, which cannot be done from Earth on account of the mighty bands of ozone at great heights in Earth's atmosphere. If there is oxygen on Mars there should also be ozone, the latter being much easier to detect than oxygen because of its absorbent qualities in appropriate wavelengths. In order to "see" this ozone we have to get rid on the interference of Earth's atmosphere, we have to get beyond its bounds.

Everything that has been said so far is based on the assumption that our cosmic observatory will conduct observations at distances of millions of miles in the same way as terrestrial observers. But motion in the practically empty interplanetary space within the Sun's gravitational field as, for example, the motion of all planets including the Earth, does not involve the expenditure of any form of energy, requiring only time, and one may easily imagine the possibility of approaching close to one of the planets and even landing on it.

Is it worth while dreaming of the migration of man to other planets in our own or some other system? We do not think there is any need for it. Our planet is the best for us in all the Universe. We have inherited it from many past generations and we must try to make it better for all mankind!



THE STORY OF PLACE NAMES

by Mario Pei

Professor of Romance Languages,
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TALE OF THREE CITIES

STRASBOURG, today dominated by its soaring cathedral spire (630 feet), was once more famous for its streets. In the early centuries of the Christian era, Germanic tribes called it *Stratarum Burgum* (the community of streets) from which its present name comes. **BAGHDAD,** (right), today capital and largest city of Iraq, is said to be named after a holy man, Dad ("The Garden of Dad"). Founded in 762 by the Caliph Al-Mansur, the city became a centre of culture and learning and is today, as always, a great trading centre. **MONTEVIDEO** (opposite page), capital of Uruguay, has a strange meaning: "a mountain saw I." This name was bestowed by Magellan in 1520, when he anchored at the mouth of the La Plata River, and saw a single hill rising high out of the midst of universally flat lands.

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IN the story of mankind, when other sources of information are lacking, important clues to the movements of races of men and the spread and progress of civilizations can often be found in the names of places and peoples. Such names reflect the history, culture and thought of the people who inhabit a country, as well as that country's development.

If we let our imagination run back to prehistoric times, we can visualize small groups of wanderers, still living in a semi-savage state, but with each group speaking some sort of primitive language, out of which will evolve the great languages of yesterday, today and tomorrow. While these languages are different, they all contain one word, a word that signifies something without which the tribe will perish—"water". One group calls water *ab,* another says *da,* a third uses *akwa.*

As the tribe comes to a promising watercourse, the headman triumphantly points to the stream and exclaims "*Ab!*", and all his followers echo the word. Centuries later, when all memory of the wandering tribe is lost, its word for water will be reflected in the stream's name, Avon. Another tribe that calls water *da* bestows that name upon streams that will later become the Don of England and Russia, the Danube of the Balkans, while early Greeks dwelling on the coast will call themselves *Danaoi,* "water people". The *akwa* tribe will give its name for water to places like Aquileia in Italy and Aquisgrana (later Aix or Aachen) in western Germany.

But another group of nomads, of entirely different language habits, coming across a region of hot, burning, waterless sands, will bestow upon it their name for "wide", "flat", "burned out", *sahra,* and today the world's largest desert still bears the name of Sahara.

The process is the same, regardless of race or group. Many centuries ago, the Anglo-Saxons of England found a suitable cattle crossing in a river and called it Oxford. Thousands of years before them, the Greeks had found a similar passage and called it Bosporus, which is Greek for "Oxford". The Arabs called their burnt-out region Sahara; the Papago Indians of the American Southwest called a region not quite so waterless Arizonac, "place of few springs".

But "water" alone was often not deemed sufficient. A more specific word was used, like "river", as is the case with India's Ganges. Or an adjective was added, like the *Grande* that in Spanish modifies *Rio,* or the *kabir* that in Arabic modifies *wadi,* turning it into the Guadalquivir (*wadi al kabir*) of Spain. Often religious imagery played a part, as in India's Brahmaputra, the "son of Brahma", chief god of the Hindu Trinity and creator of the universe, or the Brazos of Texas, which is short for *Brazos de Dios,* "arms of God".

The naming of mountains also lent itself to descriptive or poetic imagery. On the one hand we have the Celtic *pen,* "head", which enters into the Pennine Mountains of Britain and the Appennines of Italy, the Sierra Nevada which means "snowy range", the Caucasus which means "icegleaming". On the other we have Switzerland's Jungfrau ("maiden"), Africa's Ruwenzori ("cloud king"), Mexico's Popocatepetl ("mountain of he who smokes").

Seas and oceans are latecomers in the race for names. A name like Mediterranean, or Mare Internum ("Inner Sea"), as the Romans called it, could have been devised only after people had sailed around it and discovered that it is almost entirely surrounded by land. Even names like Atlantic and Arctic, drawn from mythological Atlas and from the Great Bear constellation, make their appearance in historic times, and Pacific is due to the accident of its having been peaceful at the time of its discovery in the sixteenth century.

Names of countries, continents and regions were also largely bestowed in historical times. Continent names are often the continuators of names originally given to much smaller land units (Asia, for instance, was in ancient times merely what we now call Asia Minor, and Africa was restricted to a strip of the North African coast).

Some countries and regions bear names which are descriptive of physical characteristics: Finland, for example, is Fen-land, a translation of the Finnish Suomi, meaning "swamp" or "marsh"; Poland gets its name from a root meaning "flat" or "level", which also appears in the Slavic word for "field", "meadow" (*pole* or *polje*); India is the land of the river Hind or Sind; Panjab is "five rivers"; Dekkan is "south" or "what lies on the right hand"; Mesopotamia is "between rivers".

Other countries bear the names of the people that

CONT'D ON NEXT PAGE

From Aa to Llanfairpwllgwyngyllgogerychwyrndrobwllllandysiliogogogoch

settled in them: Gaul, land of the Gauls, turned into France when the Franks occupied it, (just as Britain, land of the Britons, later became England, the country of the Angles). Still other names reflect historical episodes: the Soviet Ukraine means "frontier district", and refers to the period when it was a no-man's-land between the Russians and the Turks; Honduras means "depths", and was applied at the time of its discovery because its coast had deep waters that made good anchorages; Venezuela was named "little Venice" because the explorers found the people living in villages built over the water on stilts, something that reminded them of the canals of Venice.

Then there is the thoroughly historical process of naming places after individuals, usually famous ones. The channel island of Jersey and the American State of New Jersey take their name from Caesar (Caesarea was "Caesar's town"); so does Zaragoza in Spain, which shows the addition of Augusta to Caesarea; while the Italian region of Friuli, northeast of Venice, is Forum Julii, the "Forum of Julius Caesar", which he fortified in that area to prevent barbarian invasions of the Italian plain.

Cairo's name came from outer space

THERE are many cities that bear the name of Alexander of Macedon: Alexandria in Egypt and Alessandretta. or Iskanderun, in Turkey, are two of them (Iskander is the form assumed by Alexander in Turkish). Barcelona bears the name of the Barca or Barak family of Carthage, to which Hamilcar and Hannibal belonged (*Barak*, "lightning", was an appropriate name for one who invented the ancient version of the Blitzkrieg). Constantinople bears the name of Constantine the Great. France's Orléans and America's New Orleans are named after the Aurelian emperors of Rome.

In the Soviet Union, Stalingrad is only one of many localities that bear Stalin's name. An entire region, Lotharingia or Lorraine, bears the name of one of Charlemagne's grandsons, Lothaire, who was its ruler. Other examples are Washington, Christiania, Pretoria, Monrovia, Charleroi, Leopoldville, Port Saïd, Gibraltar (the last is Jebel Tarik, the "Mountain of Tarik", the Moorish leader who successfully led the invasion of Visigothic Spain in 711). Among names of countries we have Rhodesia, named after Cecil Rhodes, and Bolivia, bearing the name of Simon Bolivar.

A name that is unique, since it comes from outer space, is that of Cairo, the Arabic El-Qahirah, "the Victorious One", which is the Arabic name of the planet Mars, clearly visible at the time the city was founded in 970 A.D.

Among the earliest place-names on record are the ancient name of Egypt, Kem, "the Black", probably bestowed because of the color of the rich soil of the Nile valley; Babylon, Bab-Ilu, "the gate of the god"; Jerusalem, the Akkadian Urusalim, "city of the god of peace". Assyria was named after the god Assur. Smyrna, the modern Izmir, has borne its name over three thousand years; it is said to have been named after an Amazon warrior-maid. Phoenician Gaddir, oldest town in Europe, turned into the Roman Carteia and the modern Cádiz. Strabo, the Greek geographer, calls present-day Afghanistan by its ancient name of Aryana, "land of the Aryans". To offset these very ancient place names, we have very new and modern ones: Canberra, capital of Australia; Brazilia, the new capital of Brazil; the great continent of Antarctica, once mapped as Incognita, or "Unknown".

There are place names so short as to consist of a single syllable, like Ur of the Chaldees, the Aa river of Denmark, the Po of Italy, the literary Ys and Yf of France. There are others so long that they take up most of a line, like the Törökszentmiklós of Hungary, the Llanfairpwllgwyngyllgogerychwyrndrobwllllandysiliogogogoch of Wales, the Taumawathakatangihangakoauauatamateapokaiwhenuakitanatahu of New Zealand, the Chargoggagoggmanchaugagoggchaubunagungamaugg of Massachusetts.

There are animal names, like the Eriga or Erie that means "wildcat", the Les Ecureuils of Québec that means "the Squirrels", the Alacranes ("Scorpions") of Cuba, the Camarões or Cameroons ("Shrimp") of West Africa, the Canary or Dog Islands, so named by Columbus because of the wild dogs he found there, the El Tigrito ("Tiger Cub") of Venezuela, the Gatico ("Kitty-Cat") of Chile.

There are vegetable, and even mineral place names, like the Los Alamos ("the Poplars") of New Mexico, the Naranjito ("Little Orange") of Honduras, the Barbados ("Bearded Fig-Trees") of the West Indies; and the Altai ("Gold") Mountains of central Asia, the Andes ("Copper") Mountains of South America, the Iwo Jima ("Sulphur Island") of Japan.

In the United States are many cities and towns named after abstract qualities: Liberty, Independence, Hope, even Decorum, Defiance, Competition and Candor. Similar uses appear in Colombia's la Gloria, Cuba's Consolación del Sur, Bulgaria's Sofia ("Wisdom"), Rumania's Bucaresti (from the word that means "pleasure"). Poetic names include Minnesota's Lac Qui Parle ("Speaking Lake"), Argentina's Buenos Aires ("Good Winds"), Chile's Canto del Agua and Viña del Mar ("Song of the Water", "Sea Vineyard"), Brazil's Belo Horizonte and Três Coraçôes ("Beautiful Horizon", "Three Hearts"), China's Tien Tsin ("Heavenly Place"), one of the alternative names for Korea, Chosen, which is "Land of the Morning Calm".

The southern tier of South American countries are dotted with places bearing the names of relatively obscure people, but these names are historically significant because they trace the streams of European immigration to those countries. Englishmen are represented in Chile's Stokes Bay and Wollaston, Uruguay's Canning and Chamberlain, while Italian immigration is evident in Peru's Bolognesi, Paraguay's Fassardi, Argentina's Cipolletti, Rufino and Ingeniero Jacobacci.

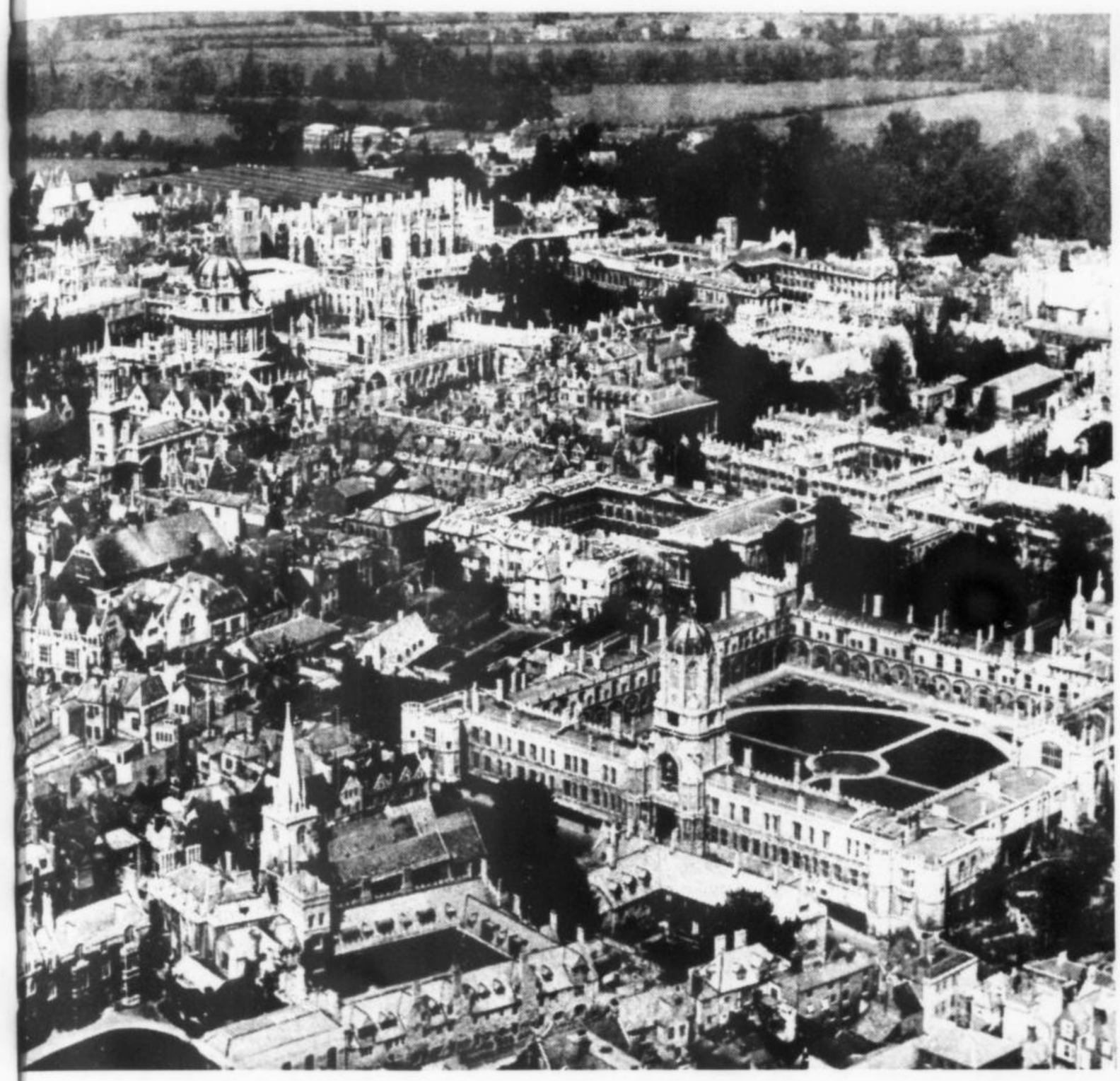
Honeymoon and Prosperity Worry & Widowville, U.S.A.

IF one were asked to name the word that most frequently appears in place names, regardless of the language, that word would have to be "new". On the one hand, this indicates a desire to mark a place as newly founded or discovered; on the other hand, it shows the natural desire for people migrating to a distant country to remind themselves of their original homeland. So we have New England and New York, New Zealand and New Guinea, Nova Scotia, Newfoundland and Novaya Zemlya, even Nueva Armenia in Honduras. We have Newton, Naples (the Greek Neapolis, or "Newtown"), Novgorod, Neustadt, Civitanuova, Villeneuve.

Joy and sorrow occasionally appear in place names. In the United States are towns named Honeymoon, Prosperity, Wealthy and Bountiful. Italy has Bellagio ("Fine Ease") and Benevento ("Fine Wind" or, perhaps, "Welcome"). But the United States also has Worry, Drab, Great Misery Island, and Widowville, in Ohio, where many Civil War widows settled down. Latin America has such dismal names as Isla Desolación ("Desolation Island") and Punto Maldonado ("Ill-Given Point"), France has Mont Dolent ("Sorrowful Mountain") and Italy has Monte Disgrazia ("Mount Misfortune").

The Hindu Kush Mountains of India mean "Hindu Killer". Bab-el-Mandeb is "The Gate of Tears", and the Kalahari Desert of Southwest Africa is "Those Who Are Tormented by Thirst". Possibly the most despondent place name of all is Crèvecœur-le-Grand, "Big Heartbreak", in France's Department of the Oise.

Misnomers in place names include, first and foremost, America, named after its supposed discoverer, Amerigo Vespucci; Yucatán and the Aleutian Islands, which are mere inquiries in the native languages ("What are you saying?", "What is this all about?"); Rio de Janeiro, so named in the erroneous belief that it was the mouth of a river; Nome, Alaska, which resulted from a misreading



TOWN WITHIN A TOWN.
The colleges of the ancient university of Oxford are a town within a town, their beauty and unity a fitting framework for a tradition of learning that dates back to the early 12th century. The town is considerably older than the university. It owes its name to the fact that centuries before, the Anglo-Saxons found a spot across a river that was suitable as a cattle crossing and called it Oxnaford. Oxford just appears in history when Edward the Elder, in A.D. 912, "held Lundenbyrg (London) and Oxnaford and all the lands that were obedient thereto" as flanking fortresses of his Thames Valley frontier.

Photo © Aerofilms Ltd., taken from "Our World from the Air" by E. A. Gutkind, published by Chatto & Windus, London.

of a pencilled inquiry "Name?" on an incomplete map.

Then there are names which are distortions of an original in another language, like America's Picketwire (Purgatoire), Smackover (Chemin Couvert), Low Freight River (l'Eau Froide, at a time when *froide* was still pronounced *fraide*), and Loose (l'Ours) Creek; or Britain's Teddymore (Tête de Mort) and Marylebone (Marie la Bonne). Repetitiousness in place names is frequent: Mount Ararat is "mountain" said twice; "Ganges River" is a repetition of "river". The two most striking examples, perhaps, are the fortress in the Russo-Turkish War of 1878 known as Krepost' Redoute Soukhoum Kalé, where the first word is "fortress" in Russian, the second in French, the last in Turkish; and Britain's Torpenhow Hill, "hill-hill-hill-hill" in four different languages.

Then there are humorous names, in which the humour is sometimes deliberate, sometimes accidental. Deliberate are America's Double Trouble, N. J., Whynot, N. C., Igo and Ono, Cal., Punkeydoodles Corner, Ontario. Accidental are Beaucoup, Ill., Pastoutville, La., Upper, Nether and Middle Wallop and Great Snoring, in England. There is something a little humorous in Peru's Caballococha ("Horse and Carriage") and Reventazón ("Big Bust"); Paraguay's Puerto Casado ("Married Port"), Bolivia's Torotoro ("Bull-bull") and Haiti's Trou ("Hole"). Germany's Irrendorf ("Madmen's Town") has recently changed its name.

Confusing place names are Georgia, common to the U.S.A. and the U.S.S.R.; Santiago (de Compostela, de Cuba, de Chile); Tripoli (in Syria and in Lybia); Ragusa (in Sicily and in Dalmatia, though the latter is better known by its Serbo-Croatian name Dubrovnik). Sometimes a very slight difference in spelling and pronunciation leads to confusion, as in the case of Darien, in Connecticut and Panama, and Dairen, in Manchuria; Burgos, in Spain, and Burgas, in Bulgaria; Acre, in the Holy Land, Accra, in West Africa, and Agra, in India. Sometimes the confusing names are within the same country, as is the case with Palencia and Valencia, Spain, or with Calcutta and Calicut, India.

It is also surprising how many repetitions of the same name appear in different lands and diverse languages. Tiflis (or Tbilisi) in Soviet Georgia is duplicated by America's Hot Springs; New York State's Stony Point is Venezuela's Punta de Piedras; Mississippi, Río Grande and Guadalquivir all mean "Big River"; Nepal and Piedmont are both "at the foot of the mountains". Other samples are the Cape of Good Hope and Greenland's Godthaab, Britain's Land's End and France's Finistère, Malaya's Singapore and India's Hyderabad ("Lion City"), Le Havre and Ceylon's Colombo.

There are many place name endings that have identical meanings: Britain's -ham, Germany's -heim, Scandinavia's -hjem, are duplicated by Hungary's -ház and the Persian-Urdu -abad; Britain's Anglo-Saxon -ton and France's Celtic -dun have as their equivalents the Greek -polis, the Slavic -gorod or -grad, the Sanscrit -pur, the German -stadt, the French -ville, the Hungarian -vár.

There is little question that a knowledge of place names leads to a better understanding of the world we live in. But a study of such names also teaches us that the human mind displays the same traits of imagination, ingenuity, humour, regardless of the locality where it is at work, or of the colour or race of its possessors. It indicates universal respect for what has been accomplished by individuals or groups, appreciation of the physical features of a world which is, in the main, bountiful, understanding of human feelings and emotions—all qualities which pertain to the human race as a whole rather than to any of its parts.

It also shows that all human beings are subject to errors and mistakes, and this, too, is a universal attribute of mankind; but our place names also show a striving toward higher and better things, a world in which there will be more peace, tolerance and mutual understanding.

This article is based on "The Book of Place Names", by Eloise Lambert and Mario Pei, just published by Lothrop, Lee and Shepard Co., Inc., New York ($3.00). *A companion volume, "The Story of Personal Names" is scheduled for publication shortly.*

HOW LONG DO THEY LIVE?

by David Gunston

How long do wild things live? Is man's normal lifespan puny by comparison with many of them? Like many other fascinating aspects of nature, records here have been much distorted. Genuine Methuselahs are as rare in nature as they are amongst human beings. In point of fact, only trees live a great deal longer than men, and from the animal kingdom only the giant tortoises of the Galapagos and Seychelles Islands regularly live beyond the human limit. Elephants, the next longest-lived animals, occasionally outlive man, but very few other creatures achieve such a feat under normal conditions.

Nevertheless, some quite remarkable facts do emerge from an undistorted study of longevity in the wild. Man has always tended to overestimate nature's powers of granting long life to her creatures. Once he realized that some things do outlive him he fell for every exaggeration that was thought up by quack sages, from the 6,000 years of every churchyard yew to the phoenix which "lyveth 300 or 500 yeares, when whiche yeares have passed she maketh a neste."

It is strange that trees should have such a hold on life, especially since the shortest lives in all nature are also found in the vegetable kingdom: many flowers of cacti live for a few hours only, and the flowers of wheat live for two hours at the most. The claim for the oldest tree in the world comes from Queensland, Australia, where a macrozamia tree is reputed to be at least 12,000 years old, although it is still only 20 feet high.

Trees 3,000 years old when Christ was born

Trees of obvious age have inspired more popular fallacies than any other living things. The famous dragon trees of Orotava, in the Canary Islands, most of which have now been destroyed, were widely held to be anything from 8,000 to 10,000 years old, perhaps with some justification, although no reliable ring-counts were ever made to prove this.

Probably the crown for the genuinely oldest tree alive to-day is held by the gigantic Tule cypress growing in a spacious churchyard in the village of Santa Maria de Tule, near Oaxaca, in Southern Mexico. Fully vigorous and of a spreading weeping habit, this amazing tree has a trunk diameter of 52 feet, which means that 28 people touching finger-tips can barely encircle it with ease. Yet it is only about 150 feet high, and is therefore over-topped by many ancient Californian sequoias, or redwoods, for which extravagant claims are also made. Yet the average girth of a sequoia 3,000 to 4,000 years old is seldom much above 36 feet. The Tule cypress's history is lost in the mists of Mexican time, but it is undoubtedly every day of 5,000 years old.

The oldest proved age for a giant sequoia, based on a careful ring-count, is 4,000, and many still growing are over 3,000 years old. Indeed, a 1,000-year-old sequoia is still a youngster. Even so, it is a staggering fact that any living organism which was contemporary with the Bronze Age and the Ancient Egyptians and Mesopotamian civilization, and which was over 3,000 years old at the birth of Christ, should still be thriving to-day. It is deserving of more respect than that given it by visiting fools with their initial-carving penknives.

Churchyard yews are often over 1,000 years old. Beech trees rarely exceed 400 years, and the normal life-span of most trees of this kind is not more than 250-300 years. Many others die before they reach 150. Frequently the known dates of alien trees artificially introduced into other countries disprove false claims of old age. For instance, it is commonly held that Francis Bacon planted the catalpa in Gray's Inn, London, but this species was not introduced from America until 1726, when Bacon had been dead exactly a century.

The Galapagos and Seychelle tortoises are the only real Methuselahs of the animal world, regularly attaining a life-span of 100 to 150 and occasionally 200 years. Tortoises, notoriously slow a-dying, have a firm grip on life, for many species may live to be centenarians. One famous Marion's tortoise lived in the army barracks at Mauritius from 1766 until 1918, when it was killed accidentally at the age of 152. Mediterranean tortoises live long, too, and one has been reliably recorded as dying when 125, while the little box turtle has been known to reach 123.

Of all mammals only elephants outlive men

Of all the mammals, from mice to whales, only the elephant sometimes outlives man, although many specimens enjoy the traditional human span or less. According to the records of the Bombay-Burmah Trading Company, of their 17,000 working elephants, only about nine per cent. live to between 55 and 65, and less than two per cent. beyond 65. Quite a number of elephants over fifty years of age have been known in zoos, and one in the U.S.A. was said to be 85 when it died.

It is the rare exception that reaches the full century, and the stories of zoo elephants having carried "several generations of children" on their backs are somewhat exaggerated. The original "Jumbo" of the London Zoo, whose popularity started such tales, died from an accident when only 24. Nevertheless, some of the tawny old bulls in herds of wild elephants have probably lived for longer than the average man.

The domestic horse, if allowed to survive into senility, probably lives next longest amongst the mammals, and several cases of fifty-year-old horses are on record, and one exceptional case of 62. Even so, a horse living to 47, as one did recently, attracts a good deal of attention. Most horse-owners have their animals destroyed long before that.

Tiniest beings have shortest life spans

A donkey has been known to live to 47 also, and in various zoos, a hippopotamus of 41, a rhinoceros of 40 several bears from 30 to 34, a spiny anteater of 42 and a chimpanzee of 26 are all authenticated instances of comparative longevity. The oldest dog whose claim seems allowable was 34; one of over 20 is exceptional, and 18 a remarkably good age for the average pet. Cats however do live rather longer, and specimens known to be 39, 31 and 27 are recorded and many over 20 are known.

The longest reliably accurate life-span for a whale is 37 years, but it is generally thought that the larger whales normally reach 30 or over—if the whalers let them. At the other end of the size scale insects have notoriously short lives, although a tapeworm once lived inside a man for 35 years.

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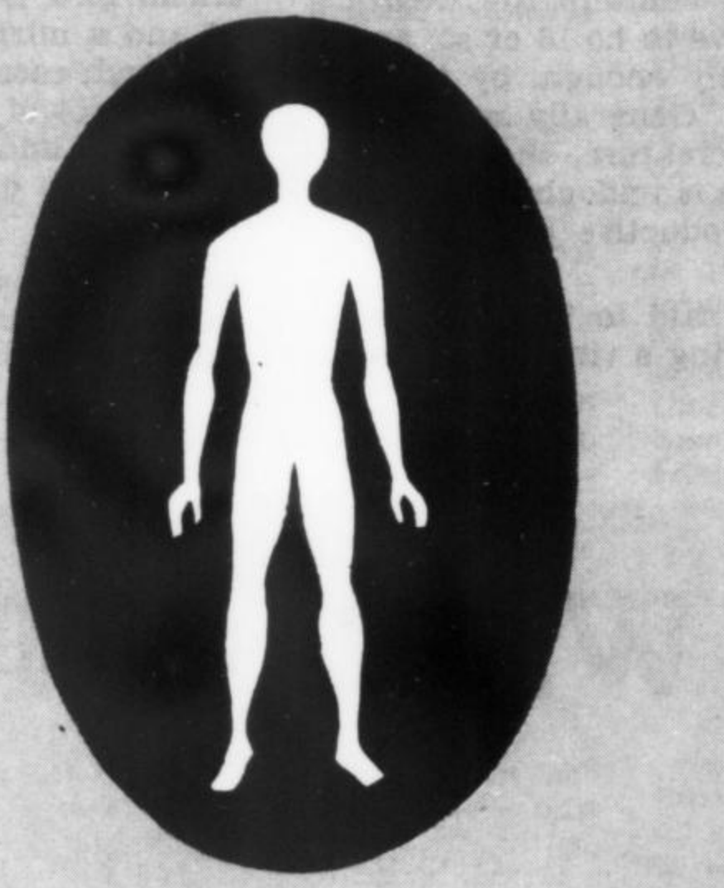
RECORD HOLDERS IN THE LONGEVITY STAKES

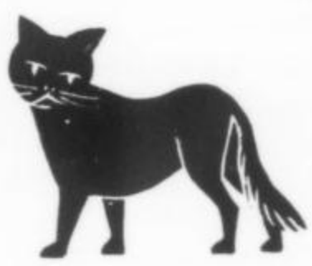


HORSE
62 years

ELEPHANT
65 years

EEL
56 years

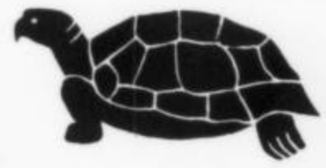
EAGLE
90 years



CAT
39 years

PARROT
140 years

WHALE
37 years



TORTOISE
200 years

DOG
34 years

OAK
500 years

MONKEY
26 years

DUCK
14 years

CYPRESS
5 000 years

SEQUOIA
4 000 years

"Slow and steady wins the race", according to the fable of The Hare and the Tortoise in which the slowest mover was the first home. The wisdom of the maxim seems to be borne out by statistics. In the animal world only the giant tortoises of the Galapagos and Seychelles Islands regularly live beyond the human limit. Here are some examples of lifespans in the animal and vegetable kingdoms arranged clockwise in order of their maximum known longevity. Between the ages of the duck and the cypress tree is a difference of 5,000 years.

HOW LONG DO THEY LIVE? *(Continued)*

In all these cases the records of creatures kept in artificial captivity are longer than they would be for wild creatures. The hazards of nature are such that real old age is comparatively rare and is achieved only by fluke or good fortune. Loss of vigour, failing eyesight, and above all, deteriorating teeth take their swift toll in the wild, leaving only a tiny proportion of the original population to enjoy a lengthy span.

Cockatoos go bald & lose their memory

In a Zoo, things are different: food is plentiful, with no need for hunting; there is permanent shelter and freedom from enemies. Even accidents are rare. The 25-year-old fox in captivity is really abnormal, for its opposite number in the wild is already at 14 or 15 ancient, with broken teeth, scarred muzzle and grizzled emaciated body. There is an authentic record of a wild tiger of 17, but among the smaller hunters the weasel is decrepit at eight. Badgers may live to be 16 or so, and they are closely followed, surprisingly enough, by toads, which live much longer than frogs. Generally speaking, the smaller and more prolific the creature, the shorter its average expectation of life. There is undoubtedly some link between physical size, low reproductive powers and longevity.

The oldest known bird is always said to be the mute swan shot in Derbyshire in 1887 bearing a ring on one leg dated either 1717 or 1711, which seems to indicate that it was at least 170 years old at the time of its death. An eagle shot in France in 1845 was found to be wearing a metal collar with a Latin inscription indicating that the bird had been used for falconry in the Caucasus in 1750, over 90 years before. Both these cases, if true, are quite exceptional.

The raven is probably the commonest bird Methuselah, records of 69 years being known. Other birds surviving for over half a century include pelicans and condors, 52; eagle-owl, 68; golden eagle, 56. Amongst captive birds parrots achieve the greatest age, 140 being about the record here, while a number have lived well over the century. Cockatoos also enjoy long life, several reaching their nineties without loss of perkiness, although baldness and loss of memory are usual.

Genuine old age amongst truly wild birds is difficult to prove, but is undoubtedly infrequent. A magpie of 30, an Arctic skua of 25, a chaffinch of 17 and several ducks of 14 are all probably holders of maximum ages. Indeed, to reach 10 is a feat for most small birds, and larger birds of 20 or so are quite uncommon. Captive geese live for much longer than their wild brethren: one was 44 when it died, and records of 33 and 37 have been proved accurate. I also know of a pet canary aged 23, and an American bird is said to be 32 and still singing. An eel of 56 and a mirror carp of 47 lead the known fish veterans. Although cases are known of a goldfish of 30 and a plaice of 25, most of the larger fish seldom reach their twentieth birthday, and nearly all the smaller species die before they are 10 or 12.

All in all, man with his traditional threescore years and ten fares batter than most of his fellow creatures. Only the silent immutable trees make him look a mere baby.

U.S.S.R. WAR ON MALARIA

(Continued from page 17)

in 1957 (3,652 primary infections and 1,445 relapses) and 4,678 in 1958 (this figure is provisional).

The figure of 10 cases of malaria per 10,000 population was accepted as the limit above which malaria was regarded as a mass disease. According to this criterion malaria was eliminated as a mass disease from wide areas of the U.S.S.R. about five years ago.

It would be justifiable to say that eradication has already been, or is about to be, attained in 88 % of the total potentially malarious area of the U.S.S.R. This undeniable success has been attributed to three simultaneously executed measures which are given in the order of importance attributed to them: first, the early diagnosis of individual cases of the disease, intensive treatment, and a careful follow-up of each case for not less than two years; second, the use of residual insecticides for the total coverage of an area, or for either barrier, village, or focal spraying; and third, the widespread prevention of mosquito breeding by the use of all available methods.

Plans have been outlined for the posteradication period 1959-1965. Attention will be concentrated on preventing the introduction of malaria from outside, and on improving mosquito control, preferably by antilarval measures. New methods are to be developed for the early recognition of symptomless parasite carriers, anti-relapse treatment is to be improved, better measures of preventing epidemics from imported cases sought, the development of old and new insecticides encouraged, insecticidal methods adapted for use in areas with silkworm industries, and the study of the epidemiology and eradication of malaria in other countries encouraged.

Now that malaria is close to the point of eradication in the U.S.S.R., there are a number of epidemiological points of interest. One is the sharp decrease in the overall incidence of malaria. Another is the absence of any sizeable foci of malaria. Small foci are still to be found, indeed, and present a potential danger.

Over the whole potentially malarious area of the Soviet Union there are now three groups of communities: those (by far the most common) where eradication has been achieved, and where cases of malaria are totally absent or only, in exceptional cases, imported; those where malaria persists as a small focus of infection; and those where, after an absence of cases for one to three years, a few local cases have appeared.

From the point of view of an epidemiologist this last group of cases is particularly important, and it has been carefully investigated. The results of this investigation have shown that, while population movements are occasionally responsible for the reinfestation of a small area, the main cause is either premature discontinuance of antimalaria measures or gaps in the system of surveillance.

The problem of the importation of cases of malaria from outside the country is also under investigation. The leading Soviet malariologists are emphatic in their warning that the success achieved in the malaria eradication campaign should not lead to a casual attitude to the problem and thus to a premature weakening of a vast organization which is geared to the complete and permanent elimination of malaria from the whole of the U.S.S.R.

Letters to the Editor

THE DRAMA OF NUBIA

Sir,

The special issue (Feb. 1960) of THE UNESCO COURIER (Save the Treasures of Nubia) was a specially fine achievement and passionately interesting. It brought home to me most vividly the dramatic situation created by the threatened inundation of the wonders of Philae and Abu Simbel. It is to be hoped that international solidarity will now play its part in resolving this problem.

Madame Lugardon
Toulouse, France

IMPACT OF THE CINEMA

Sir,

In view of the importance of the cinema as a medium of artistic expression, I think I am expressing the wish of many readers in asking you to devote an issue of your magazine to this subject. In it you could deal with its history and its technical, aesthetic, economic and social problems. The fact, pointed out by Georges Sadoul in the article you published last April, that the cinema has now penetrated into every corner of the globe enormously increases the interest of this theme.

Ruth Cecilia Levit
Buenos Aires, Argentine

Ed. note: THE UNESCO COURIER *has already devoted two issues to the cinema (Sept.* 1951 *and Jan.* 1955) *as well as a large part of the April* 1959 *issue referred to by our reader. However, this does not exclude the possibility of this vast and interesting subject being explored still further in future issues.*

FAITH REVIVED

Sir,

As a new reader I was immediately struck by the attractive appearance of your magazine and your choice of subjects. I am now able to measure the scope of the progress that has been made in humanitarian work. As I see it, UNESCO's main task is to bring about a greater measure of equality between the living standards of all peoples and, above all, to fight against the great scourge commonly called racialism which spreads its contamination among the simple-minded.

I realize that UNESCO has undertaken a work of edification in the widest sense of the expression, a humanitarian one demanding much sacrifice yet offering unbounded promise. The thought of this great work, so patiently pursued, puts new heart into me. Seeing so much evil around me I had become blasé, no longer able to believe in human virtue.

Reading THE UNESCO COURIER has made me realize, with feelings in which bitterness and satisfaction are intermingled, that I was deluding myself and that my ideas, so full of pessimism, were completely unjustified. Becoming conscious of the fact that there are men and women who, both in thought and act, work for the good of others has revived my flagging spirits, and restored my vitality. So saying, may I pay tribute to all those who are inspired by a humanitarian ideal and who devote their lives to it with enthusiasm and unselfishness. The results achieved so far are still insufficient, but they point the way to broader and more hopeful perspectives.

Bensahli Mustapha

WHAT REPLACES 'THE COUCH'?

Sir,

I am very curious to know just what method of treating the mentally ill is being used in the Soviet Union if psychoanalysis is taboo in that country.

W. H. Schobert
Hillsdale, Michigan, U.S.A.

Ed. note: An article on this subject will appear in a future issue.

HOW MANY ESPERANTISTS?

Sir,

The article on Dr Zamenhof and Esperanto published in your December issue unfortunately included information that was incorrect. There are certainly not several million Esperanto speakers. The petition asking UNESCO to give its patronage to the language admittedly bore the signatures of 895,432 individual persons and 492 organizations grouping 15,454,780 members who were never consulted and who therefore can only be considered as approving the auxiliary language.

According to *Esperanto Revue,* official organ of the Universala Esperanto Asocio (federative association of the national groups) this body then had 27,138 members (Esperanto speakers and supporters) at the end of 1958, and the review itself had 4,988 subscribers. If something like 5,000 members of another association, Sennacieca Tutmonda Asocio, and perhaps 10,000 non-affiliated members in eastern Europe and China are taken into account, the total number of persons able to use the language, with varying ability, is between 45,000 and 50,000. Esperanto is by no means the sole auxiliary language. Other, more modern idioms exist which have the advantage of being immediately comprehensible to people with Anglo-Roman cultural backgrounds. These are Interlingue (ex-Occidental) with headquarters at Cheseaux-sur-Lausanne, Switzerland and spoken in 40 countries, and Interlingua, a variant which is more Latin in content. Abstracts in this variant are published in more than 20 medico-scientific reviews, chiefly in the United States.

M. L. de Guesnet
President, Interlingue Union
Cheseaux-sur-Lausanne

Ed. note: A Unesco book entitled Scientific and Technical Translating (*second edition* 1958, *page* 194 § 6.6.8.) *gives the following information on this subject:*

"For various reasons, the number and distribution of people in the world who can both understand and speak Esperanto is not known with accuracy. Statistics claimed to have been compiled as objectively as possible showed that, in 1952, *there were* 280,000 *persons in* 32 *countries reliably known to understand and speak it. This is stated to be more than double the world's total in* 1926, *even though teaching of the language had meanwhile been forbidden by various régimes. It does not include scientists in China, Japan, the Soviet Union, Bulgaria and various other countries who, it is thought, would bring up the total to at least* 380,000."

ZAMENHOF & THE PHILATELIST

Sir,

Your issue of last December included an article on Dr. Zamenhof, creator of Esperanto. I should like to add some information from the philatelist's point of view. The first stamps commemorating Esperanto and its creator were published in the U.S.S.R. in 1926 during the international congress of Esperantists and in 1927 to commemorate the 40th anniversary of the international language. After the U.S.S.R. it was the turn of Brazil, which marked the ninth Esperantist Congress in 1936 with a stamp, with another the following year for the 50th Esperanto anniversary and eight years later with two stamps during the Rio de Janeiro Congress.

Other nations, chiefly in Central Europe, have taken Zamenhof and Esperanto as subjects for their stamps: Bulgaria in 1947 and 1957; Austria, which included the star symbol of Esperanto on a stamp design in 1945 and issued an Esperanto stamp in 1954; Yugoslavia, which issued two commemorative stamps for the 38th Universal Congress in 1953, overprinted with the letters "STT. Vujna" in red for its zone in Trieste, and Poland, which celebrated the International Congress in Warsaw and Zamenhof's centenary in 1959 with two stamps.

Pierre Girot
Association Française de Philatélie
Educative et Culturelle, Paris

From the Unesco Newsroom...

WORLD PRESS PICTURE: Some 30,000 newspapers (8,000 of them dailies) are published in the world. Daily newspapers (250 million copies) represent a circulation of about 92 copies per 1,000 inhabitants. These facts are revealed in a UNESCO study (1) following surveys made in 146 countries. Roughly one-third of all newspapers are published in North America, one third in Europe (including the Soviet Union) and the remaining third spread over the rest of the world.

■ **MOST POPULAR PROFESSION:** *Engineering is the most popular profession for both boys and girls in Poland according to a public opinion poll carried out by the Polish Radio Organization among* 2,400 *graduate students. Professions selected by male students in order of popularity were: engineering, scientific research, medicine, law and the army. For the girls the choice was: engineering, teaching, medicine, artistic professions, scientific research, law.*

VATICAN CITY: CULTURAL PROPERTY UNDER SPECIAL PROTECTION

THE entire State of Vatican City was recently inscribed in the "International Register of Cultural Property under Special Protection" at a ceremony held in Unesco House, Paris. The Holy See is the first State, among those that are parties to the Convention for the Protection of Cultural Property in the Event of Armed Conflict, which has asked for the inscription of a monumental centre in the Register.

The Vatican City territory, an area of. 44 square kilometres, contains priceless artistic and historic treasures: the Basilica of St. Peter, the Vatican Palace with its galleries and museums, the Library and Secret Archives, etc.

The International Convention for the Protection of Cultural Property in the Event of Armed Conflict was adopted on May 14, 1954, by an intergovernmental conference convened at The Hague under the auspices of Unesco. Under its terms contracting parties undertake, in the event of armed conflict, to safeguard as well as to respect cultural property on their own territory or on that of other contracting parties. So far, thirty states have deposited instruments of ratification or accession.

ON EQUAL TERMS WITH MEN: Thirty-four countries have now ratified or acceded to the United Nations Convention on the Political Rights of Women, the latest country to do so being Turkey. Under the Convention, women are entitled to vote, hold public office and exercise other public functions on equal terms with men.

■ **AIRBORNE TV FOR CLASSROOM:** *Later this year schools in six states in the Middle West of the United States will tune in to televised classroom courses beamed from an airliner circling thousands of feet above. Programmes will be broadcast from Purdue University in Indiana and relayed to the flying transmitter overhead which will retransmit them to an area of* 300 *to* 400 *miles in diameter, thus bringing* 13,000 *schools and* 5,000,000 *students within range of one TV transmitter.*

NUCLEUS OF A NEW SCIENCE MUSEUM: After a three-and-a-half-year odyssey to ten countries where it was seen by more than half a million persons, a UNESCO science exhibition, "Energy and its its Transformation" has been presented to Ceylon where it will serve as the nucleus of a new science museum in Colombo. With more than 100 pieces of scientific apparatus and many descriptive panels, "Energy and Its Transformation" covers all phases of its subject from nuclear power reactors to the use of sunlight by algae. Other UNESCO science exhibitions have travelled to many parts of the world, attracting a large number of visitors.

(1) "Statistics of Newspapers and Other Periodicals", Unesco, Paris. Price $1.00; 5/- (stg.); 3.50 N.F.

■ **UNESCO MEMBERSHIP NOW 82:** *The representative of the Republic of Guinea in London has signed, on behalf of his Government, the Constitution of* UNESCO *which is deposited at the Foreign Office. Guinea, admitted to the United Nations on December* 12, 1958, *by unanimous vote of the U.N. General Assembly, thus becomes the* 82*nd member of* UNESCO.

'CHOPIN YEAR' Musicians and musicologists from all over the world gathered in Warsaw on February 22, the 150th anniversary of the birth of Frederic Chopin, for the inaugural ceremonies of the "Chopin Year" which is being organized by the Polish Government. First official event of the "year" has been an international competition for pianists under 30 years of age, and many other commemorative events have been announced for the rest of 1960 by the Polish organizing committee.

■ **'CLOUDS AND METEORS':** *A colour filmstrip entitled "Clouds and Meteors" and a set of colour slides have been produced by* UNESCO *in co-operation with the World Meteorological Organization (WMO) based on photographic material published by WMO in the "International Cloud Atlas". They demonstrate technical data on cloud classification and cloud codes and are intended for university classes as well as special courses for meteorological observers. A detailed commentary accompanying the filmstrip and slides is available in English only, but French and Spanish versions are being prepared.*

SUPER-SOUND AND BUMPER CROPS: Soviet scientists are studying the use of super-sound for increasing crop yields and accelerating their maturity. Experiments in treatment of seed before sowing are being made in laboratories of the U.S.S.R. Institute of Plant Breeding. These show that ultra-sound treatment of seeds increases their germinating power, the vegetation period is reduced and the yield considerably increased —nearly 50% in the case of potatoes. Scientists explain the action of super-sound by its influence on the mutability of hereditary characteristics.

■ **RADIOISOTOPES & SNAKEBITES:** *A radioactive meal eaten by a snake may help to provide the key to an effective antidote for its venom, according to Mr Norman Veall, an expert of the International Atomic Energy Agency who recently spent six months in Thailand, studying medical applications of radioisotopes. One experiment he carried out was to "mark" a cobra's venom with radioiodine. The snake was fed with radioactive meat and its venom was then extracted for use in studies on snakebite immunity and in research for antidotes to the poison.*

U. N. CANCER RESEARCH PRIZES: The General Assembly of the United Nations has instituted prizes totalling $100,000 to be awarded for the most outstanding scientific research work in the causes and control of cancerous diseases. The Assembly's decision was taken as the result of a proposal made by the Byelorussian S.S.R., which pointed out that two million people die of cancer each year (1 per 1,000 of the world's population).

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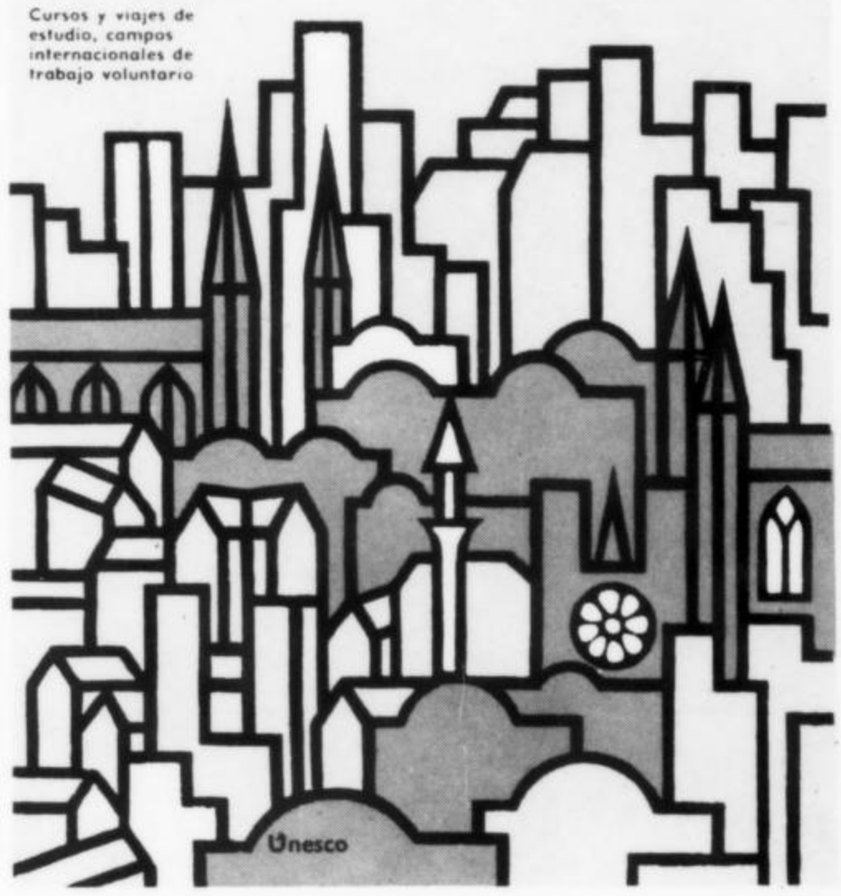

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WHAT'S IN A PLACE NAME? History, legend, drama and romance—all have contributed to the names by which places throughout the world, from towns and villages to hills and valleys, have become known. Above, part of the port of Copenhagen, whose English name comes from the Danish Kobenhavn or "Merchants' Port." See page 26.

A WINDOW OPEN ON THE WORLD

The UNESCO Courier

BUDDHIST PAINTINGS OF ANCIENT JAPAN

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MAY 1960
(13th year)

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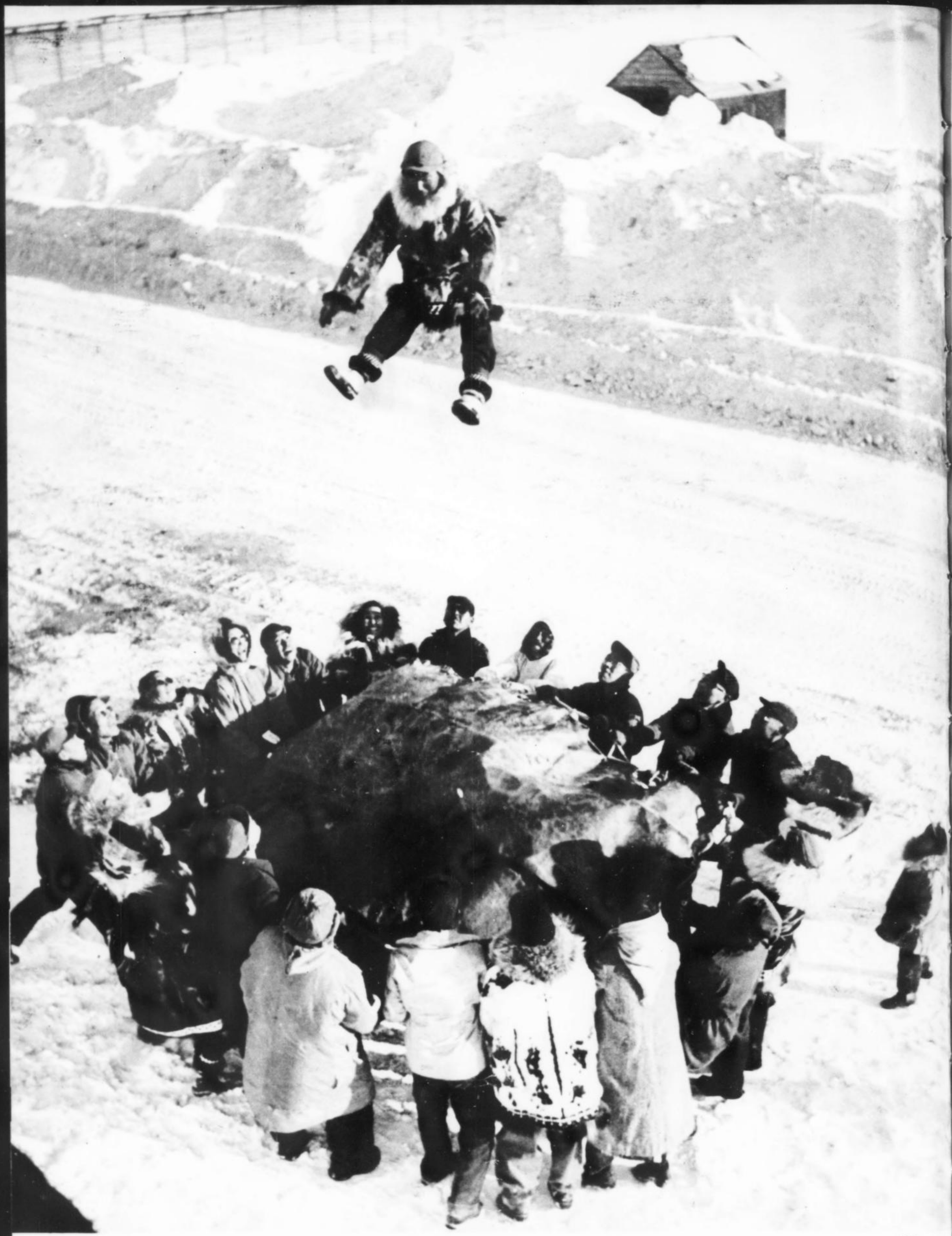

USIS

AIRBORNE ESQUIMO has just been given a "blanket toss", a favourite game among these people living in the Far North of the American continent. Here, well within the Arctic Circle, the Esquimos and other inhabitants of Aklavik, Canada's largest Arctic community, are busy moving their town lock, stock and barrel from an unsafe site on the bank of the Mackenzie River to a location 70 miles away. For story of this " town toss " (see p. 26)

The UNESCO Courier
A WINDOW OPEN ON THE WORLD

MAY 1960
13TH YEAR

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COVER PHOTO

High dignitary of the Imperial Japanese Court of Kyoto painted in his official robe of black silk by a 12th century artist. (See page 18)

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Unesco, Place de Fontenoy, Paris 7e.

UNESCO'S NUBIAN CAMPAIGN IS LAUNCHED

March 8, 1960. In the Great Conference Hall at Unesco House, Vittorino Veronese, Director-General of Unesco, launches the world appeal inaugurating the International Campaign for the Preservation of the Monuments of Nubia.

UNESCO-Berretty

"I INVITE governments, institutions, public or private foundations and men of goodwill everywhere to contribute to the success of a task without parallel in history." With this appeal to world-wide solidarity, Vittorino Veronese, Director-General of UNESCO, opened the International Campaign for the Preservation of the Monuments of Nubia, during an impressive ceremony in UNESCO's Headquarters on March 8.

Presided over by André Malraux, French Minister of State in charge of Cultural Affairs (see page 8), the ceremony took place in the presence of heads of diplomatic missions in Paris, of UNESCO's permanent delegates and its chief officials and of leading figures in international official and cultural life.

After making his appeal (page 6) UNESCO's Director-General announced the names of members of the Committee of Patrons, of which King Gustav VI Adolph of Sweden has agreed to be Chairman, and the membership of the International Action Committee which will assist in organizing the campaign. He also named the members of the Advisory Committee of Experts which has been set up by the United Arab Republic. (For membership of the first two committees see pages 14-15)

During the ceremony, messages from three heads of state—King Gustav VI Adolph of Sweden, President Gamal Abdel Nasser of the United Arab Republic and Ferik Ibrahim Abboud, President of the Supreme Council of the Armed Forces and Prime Minister of the Republic of Sudan—were read by their special representatives.

The vastness and urgency of the operations which must be undertaken to save the monuments of Nubia from inundation by the waters of the new Aswan High Dam were evoked by King Gustav VI Adolph: "The task is so big and the time at our disposal so limited that we can scarcely hope to accomplish everything that might be desirable. But nevertheless if we are all determined to make a great common effort, very considerable results will be obtained."

The vast number and importance of the threatened sites and monuments in Sudanese Nubia were referred to by the Prime Minister of the Republic of Sudan, who said that since 1955 his country's Antiquities Service had been working in the endangered area. Excavations had been undertaken at Debeira, Serra, Faras and Semma. In addition a preliminary survey had been carried out from the air and on the ground to ascertain the number and importance of the sites and monuments that would disappear under the new reservoir.

"Over one hundred sites have so far been recorded," said his message. "Among them are four temples, many rock graves and rock chapels, fourteen fortresses four thousand years old, twenty Christian churches, seven ancient towns, numerous cemeteries, rock drawings and rock inscriptions. Of these hundred sites, forty-seven will disappear as early as 1963.

"With less than three years to do the work, the Sudan Antiquities Service cannot alone carry out such an enormous task and that is why I am appealing to the world at large to come and help us. We shall be most grateful to any country or scientific institution which is able to come and assist us to explore 800 square kilometres, to excavate the 47 known sites and those which have not yet been discovered, to dismantle and re-erect two temples and to save the paintings from three churches. Assistance could be given either by sending archaeological missions to the Sudan, or lending the services of technicians, or by giving financial help. We are prepared to give at least fifty per cent of the finds to contributors and, since Nubia is a little-known country, finds are likely to be of great importance."

Help is already forthcoming, and President Abboud's message went on to list a number of offers already accepted by the Sudanese Government which have come from several countries and scientific institutions. (See page 12).

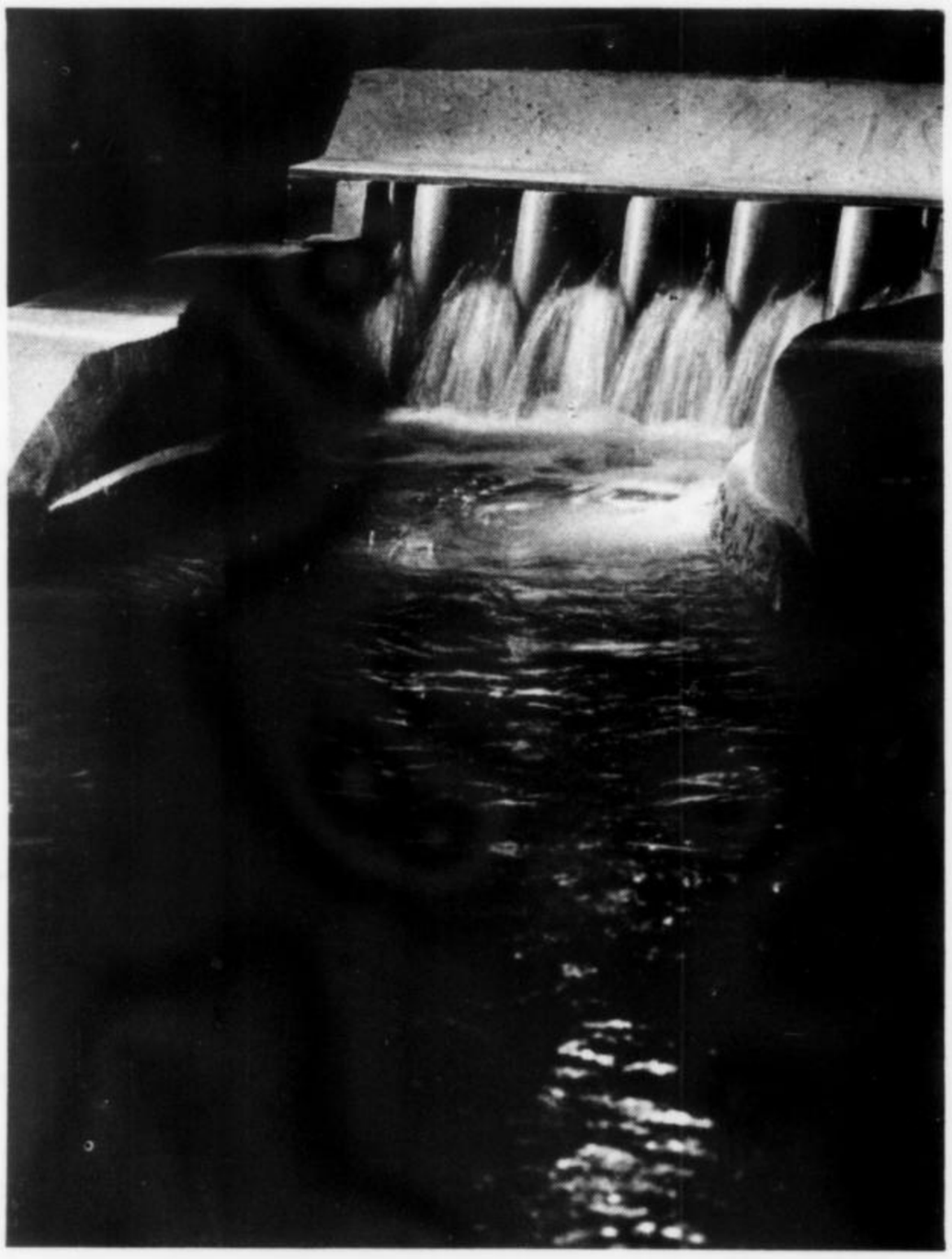
PRESIDENT Nasser defined the imperative reasons for the construction of the new Aswan Dam in these words:

"The High Dam Project corresponds to the necessities of life; it meets the demands of demographic, social and economic development and should bring prosperity to the populations of the Nile Valley. But these demands should not make us forget that it is indispensable to assure the safeguarding of an essential part of our heritage..."

President Nasser's message ended with a tribute to international co-operation: "This action will constitute, we have no doubt, a happy precedent for the generation of the United Nations, that generation which is trying to make the Charter a living reality, a belief and a faith and which affirms its confidence in the value of human co-operation and seeks a better knowledge of civilizations and cultures despite differences of time and place."

United Nations support for UNESCO's campaign was announced in a message sent by Dag Hammarskjold, Secretary-General of the U.N., who has agreed to become a member of the Committee of Patrons. Mr. Hammarskjold declared:

"All who recognize the imperative human needs which necessitate the flooding of the Nubian Valley must also welcome and wish to further the efforts to safeguard the threatened archaeological treasures that form so significant a part of man's cultural heritage... I cannot but believe that a full and generous response will be forthcoming. The United Nations stands ready to lend UNESCO and the Governments concerned any support it can in the great task to which they have set their hand."

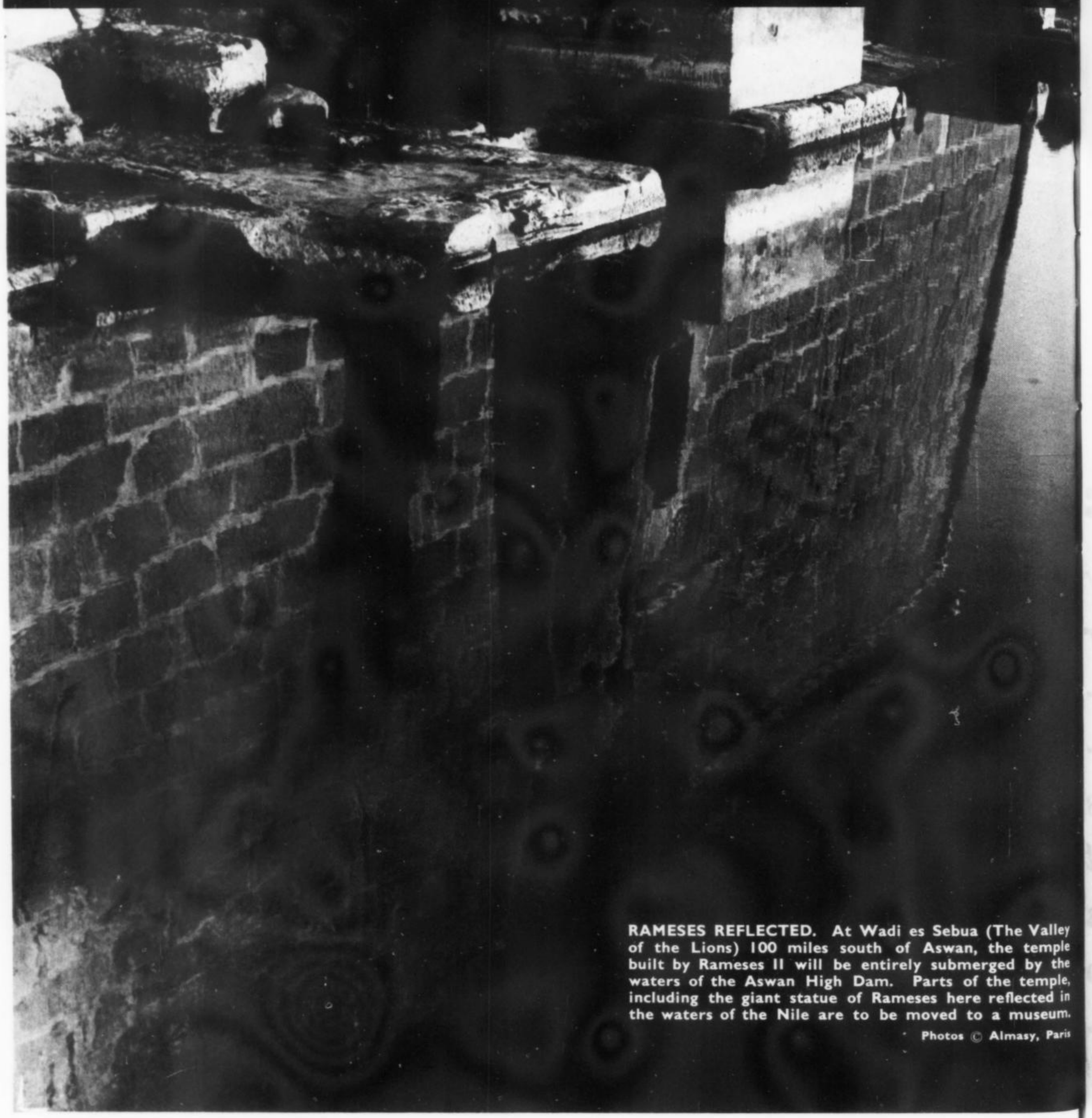


ASWAN NEAR MOSCOW

Near to Moscow, in the laboratory of the Ministry of Hydraulic Power Station Construction, a model has been built of the new Aswan High Dam. Engineers are seen here carrying out tests on this scale model of the mighty dam, the Sadd El Aali, which will make possible a tremendous increase in the area of cultivable land and the supply of electrical energy. Thus it holds incalculable promise for the agricultural and industrial development of the United Arab Republic and the welfare of its people.

Official Soviet photos

MARCH 8 APPEAL BY VITTORINO VERONESE DIRECTOR-GENERAL OF UNESCO



RAMESES REFLECTED. At Wadi es Sebua (The Valley of the Lions) 100 miles south of Aswan, the temple built by Rameses II will be entirely submerged by the waters of the Aswan High Dam. Parts of the temple, including the giant statue of Rameses here reflected in the waters of the Nile are to be moved to a museum.

Photos © Almasy, Paris

WORK has begun on the great Aswan dam. Within five years, the Middle Valley of the Nile will be turned into a vast lake. Wondrous structures, ranking among the most magnificent on earth, are in danger of disappearing beneath the waters. The dam will bring fertility to huge stretches of desert ; but the opening up of new fields to the tractors, the provision of new sources of power to future factories threatens to exact a terrible price.

True, when the welfare of suffering human beings is at stake, then, if need be, images of granite and porphyry must be sacrificed unhesitatingly. But no one forced to make such a choice could contemplate without anguish the necessity for making it.

It is not easy to choose between a heritage of the past and the present well-being of a people, living in need in the shadow of one history's most splendid legacies, it is not easy to choose between temples and crops. I would be sorry for any man called on to make that choice who could do so without a feeling of despair; I would be sorry for any man who, whatever decision he might reach, could bear the responsibility for that decision without a feeling of remorse.

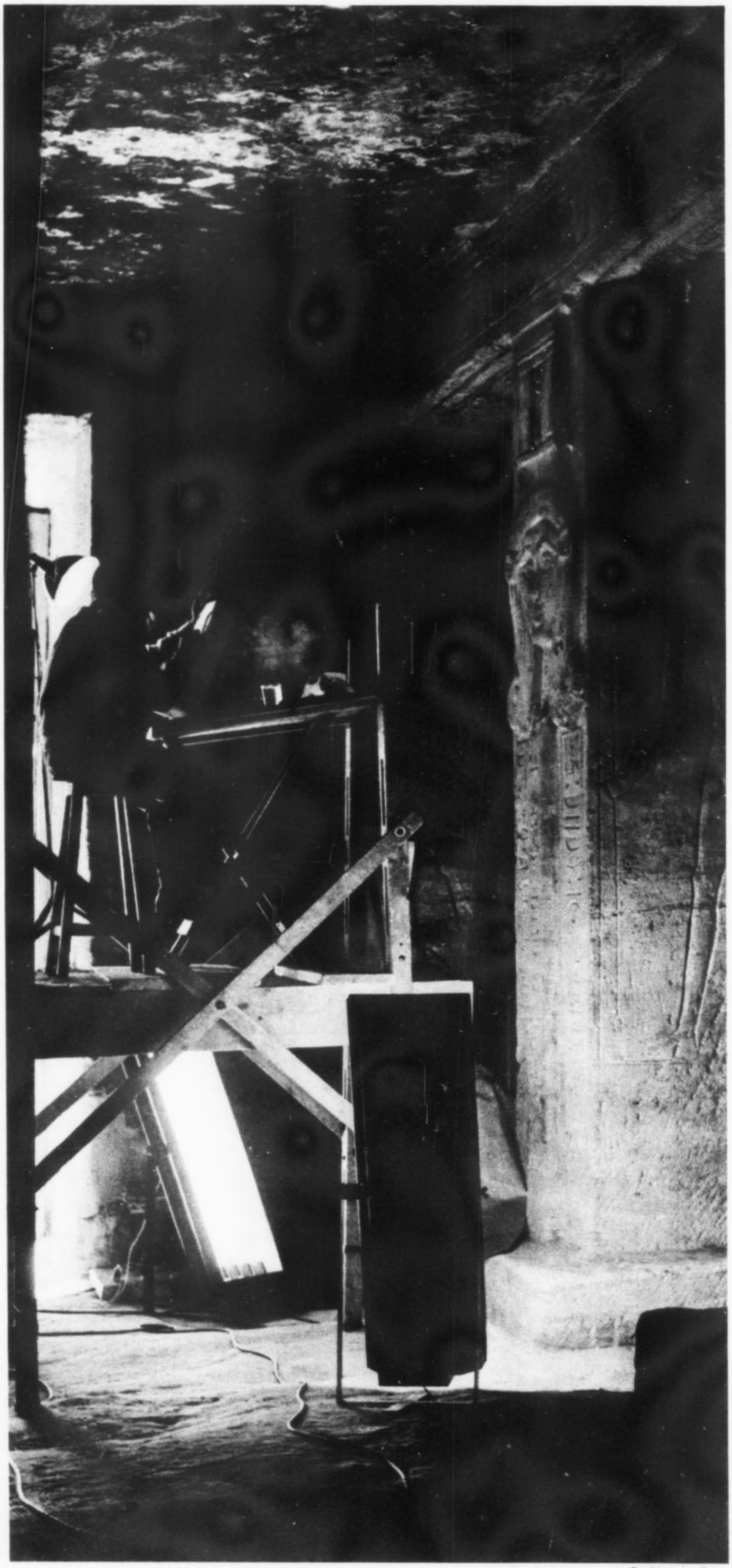
It is not surprising, therefore, that the governments of the United Arab Republic and Sudan have called on an international body, on Unesco, to try to save the threatened monuments. These monuments, whose loss may be tragically near, do not belong solely to the countries who hold them in trust. The whole world has the right to see them endure. They are part of a common heritage which comprises Socrates' message and the Ajanta frescoes, the walls of Uxmal and Beethoven's symphonies. Treasures of universal value are entitled to universal protection. When a thing of beauty, whose loveliness increases rather than diminishes by being shared, is lost, then all men alike are the losers.

Moreover, it is not merely a question of preserving something which may otherwise be lost; it is a question of bringing to light an as yet undiscovered wealth for the benefit of all. In return for the help the world gives them, the governments of Cairo and Khartoum will open the whole of their countries to archaeological excavation and will allow half of whatever works of art may be unearthed by science or by hazard to go to foreign museums. They will even agree to the transport, stone by stone, of certain monuments of Nubia.

A new era of magnificent enrichment is thus opened in the field of Egyptology. Instead of a world deprived of a part of its wonders, mankind may hope for the revelation of hitherto unknown marvels.

So noble a cause deserves a no less generous response. It is, therefore, with every confidence that I invite governments, institutions, public or private foundations and men of goodwill everywhere to contribute to the success of a task without parallel in history. Services, equipment and money are all needed. There are innumerable ways in which all can help. It is fitting that from a land which throughout the centuries has been the scene of— or the stake in—so many covetous disputes should spring a convincing proof of international solidarity.

"Egypt is a gift of the Nile"; for countless students this was the first Greek phrase which they learnt to translate. May the peoples of the world unite to ensure that the Nile, in becoming a greater source of fertility and power does not bury beneath its waters marvels which we of today have inherited from generations long since vanished.



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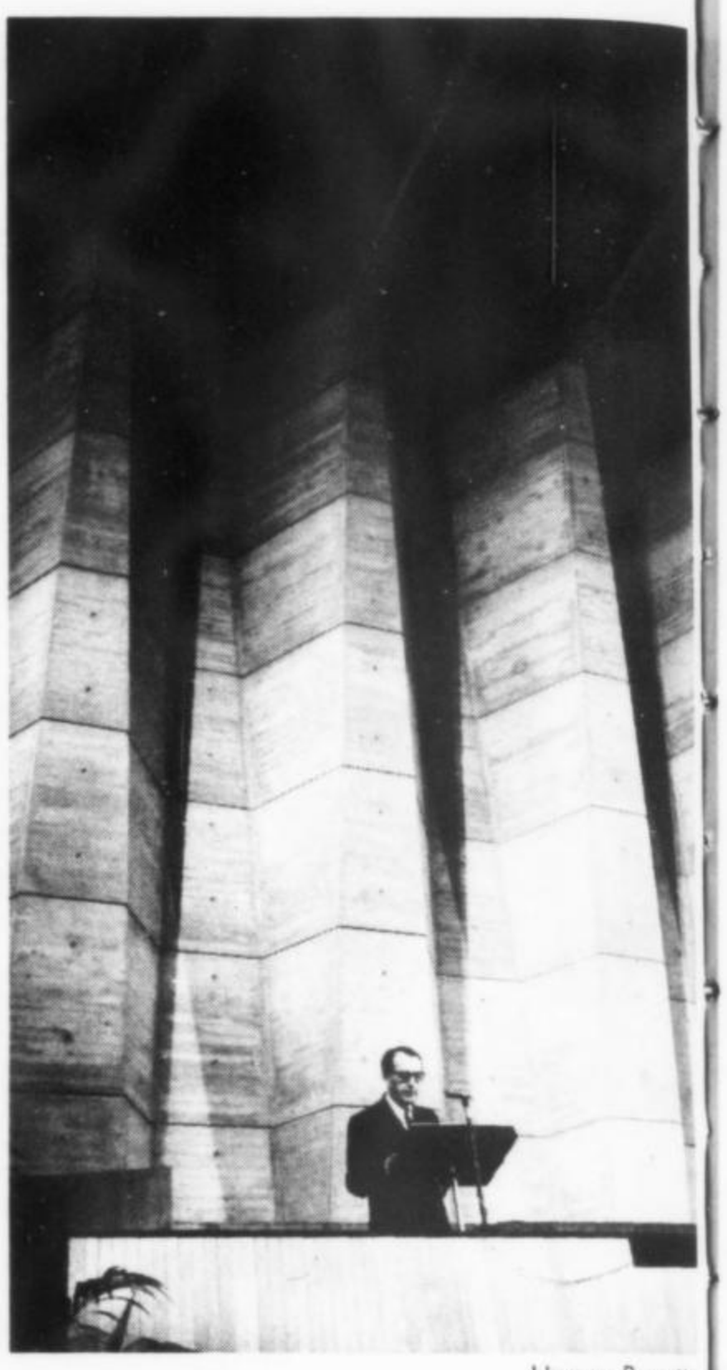

Unesco-Berretty

André Malraux:

'There is only one action over which indifferent stars and unchanging rivers have no sway: it is the action of a man who snatches something from death'

The following is the full text of an address delivered in Unesco's Headquarters on March 8 by André Malraux, French Minister of State for Cultural Affairs. M. Malraux was presiding at the ceremony which marked the launching of the International Campaign for the Preservation of the Monuments of Nubia.

★

ON March 8 1960, for the first time, the nations, though many of them even now are engaged in overt or open conflict, have been summoned to save by a united effort the fruits of a civilization on which none has a pre-emptive claim.

Such an appeal, in the last century, would have seemed fanciful. Not that Egypt was unknown then. Her spiritual greatness was surmised, her majestic monuments were admired. But if the West knew Egypt better than it knew India or China, this was because it saw in her a province of the Bible. Through the Bible, Egypt, like Chaldaea, belonged to the dawn of our own history. Of the forty centuries Napoleon evoked as he stood before the Pyramids, the supreme moment was that in which they were beheld by Moses.

Temples have power to speak and statues acquire a soul

THEN, gradually, Egypt came into her own, though still within narrower limits than one would imagine. The pre-eminence of Graeco-Roman architecture and sculpture was never called in question; Baudelaire could speak of Egyptian "naïveté." These tremendous temples, these rapt masterpieces which for three thousand years had seemed to commune with each other in the same unchanging dream, were above all prized as records, the only ones bequeathed to us by the ancient East. They fell within the domain of history rather than of art. In 1890 as in 1820, though the West was moved to study Egypt, it was not moved to safeguard her works.

With our own century, however, has come one of the greatest developments in man's spiritual history. These temples which had been looked on only as records have again become living witnesses; these statues have acquired a soul. Not, to be sure, the spirit which first informed them; but one which is their own, which we find nowhere else but in them, and which nobody before us has found there.

We talk of this art as a witness to a civilization, just as we say that Romanesque art bears witness to the Christianity of its time. Yet in fact we can only really comprehend a culture that still survives. Egyptologists have done noble work: but the faith of a priest of Amon, the basic attitude of an Egyptian to the world around him, are beyond our grasp. The humour of the *ostraca,* the homely figurines, the text where a soldier calls Rameses II by his nickname as familiarly as his veterans used Napoleon, the worldly wisdom of the legal texts—how are we to relate these to the Book of the Dead, to the funereal majesty of the great statues, to a civilization which for three thousand years seemed dedicated only to the celebration of the after-life?

Nefertiti haunts our painters Cleopatra inspires our poets

THE only ancient Egypt which can come alive for us is the one conveyed by its art—and this is an Egypt that never existed at all, any more than the kind of Christianity which would be inferred from Romanesque art if that were our only witness to it. Yet Egypt has survived in her art, not through famous names or lists of victories... Despite Kadesh, one of history's decisive battles, despite the cartouches carved and recarved at the behest of the bold pharaoh seeking to force his lineage upon the gods, Sesostris has less meaning for us than the unfortunate Akhnaton. The face of Queen Nefertiti haunts our painters as Cleopatra has inspired our poets; but whereas Cleopatra is a queen without a face, Nefertiti, for us, is a face without a kingdom.

Egypt, then, survives by virtue of certain forms. And today we know that these forms, like those of all religious cultures, are not to be interpreted in terms of the living people they profess to portray but in terms of the conventions which raise these people to the other world. At their highest expression, Egyptian conventions were designed to mediate between ephemeral men and the controlling stars. It is an art that consecrates night.

That is what we all must feel before the Sphinx at Gizeh, as I remember doing last time I saw it at twilight. I thought then, "How the second, furthermost pyramid enfolds the view, and how it makes this colossal death-mask seem like the guardian of some trap set to lure the heaving desert and the darkness. This is the hour when the oldest fashioned forms recapture the soft murmur with which the desert echoes the timeless devotions of the East; the hour when they restore to life these places where the gods were heard; when they banish the immensity of chaos and order the stars which seemingly emerge from night simply to gravitate round them."

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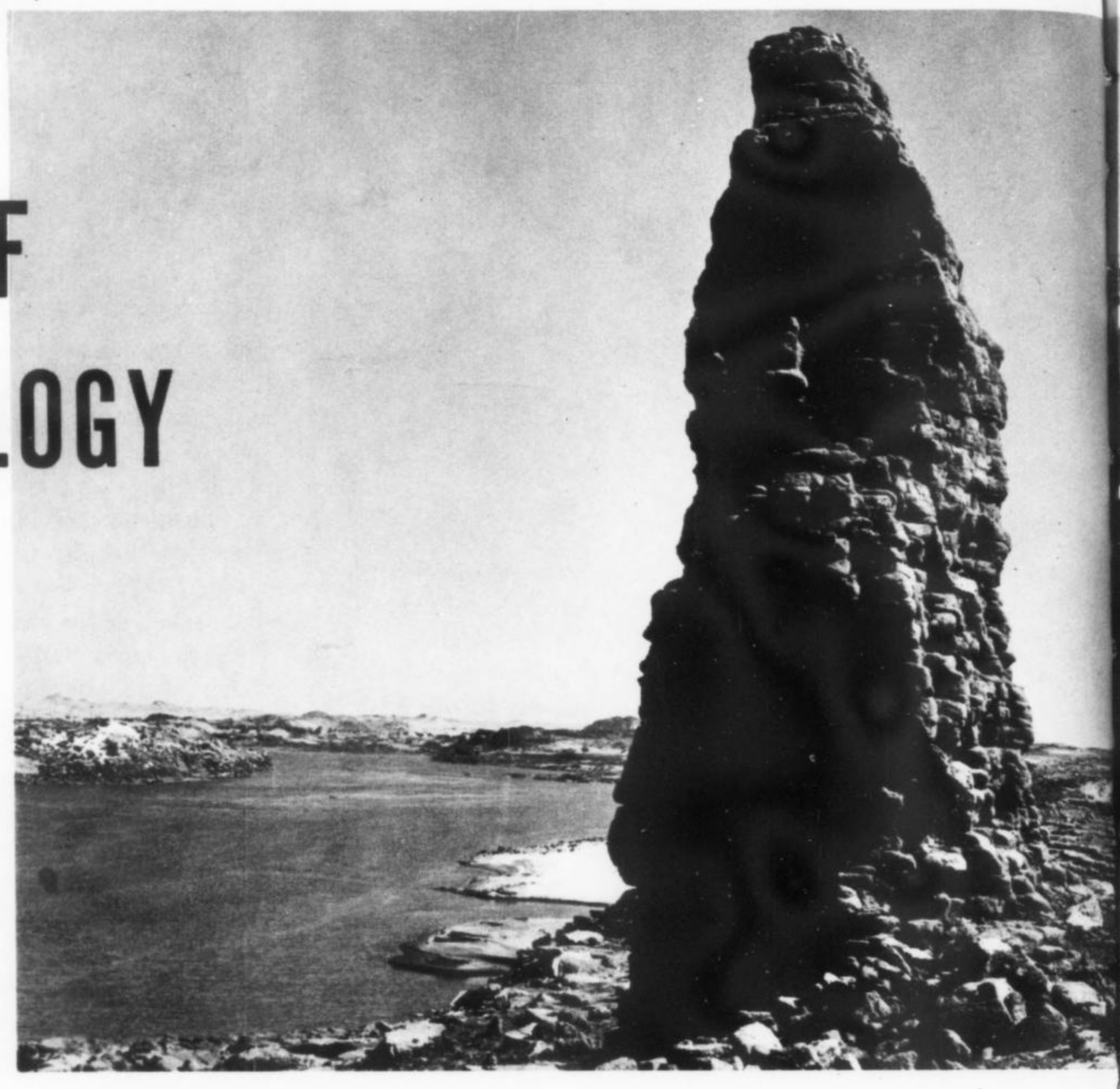
T.V.A. OF ARCHAEOLOGY



ANCIENT POTTERS' KILNS and pottery remains (photos centre and far right) were among the important discoveries made during recent excavations at Faras carried out by the Sudan Antiquities Service. Dr. William Adams (in foreground), an American archaeologist who was sent to the Sudan by Unesco, collaborated in this work. Right, the Nile as seen from one of two fortresses on granite cliffs at Semna in the threatened area of the Sudan.

Photos © Almasy, Paris

In such a way, during three thousand years, Egyptian art translated the temporal into the eternal.

Let there be no misapprehension about this today: it is not as a witness to the past that it moves us, nor as what used to be called beauty. "Beauty" has become one of our age's most potent mysteries, the inexplicable quality which brings the Egyptian masterpieces into communion with the statues of our own cathedrals, or the Aztec temples, or the Indian and Chinese grottoes; with the paintings of Cézanne and Van Gogh, with the greatest dead and the greatest living artists; with, in short, the whole treasury of the first world civilization.

This is an immense regeneration, of which our own Renaissance will soon seem a diffident prefiguring. For the first time, men have discovered a universal language of art. We feel its influence acutely, even if we only partly understand its nature. This tremendous storehouse of art, of which we are now becoming conscious, draws its force no doubt from its being the most signal victory of human effort over death. To the impregnable "nevermore" that governs the history of civilizations, this art opposes its own mysterious grandeur.

Of the force that brought Egypt into being out of prehistoric night, nothing now remains; but the impulse which engendered these giants which are threatened today still speaks to us as clearly as the genius of the master-craftsmen of Chartres, or the genius of Rembrandt. The emotion we share with the creators of these granite statues is not even one of love, nor a common feeling for death—nor even, perhaps, a similar way of looking at their work; yet before their work, the accents of anonymous sculptors forgotten during two thousand years seem to us as much untouched by the succession of empires as the accents of mother love.

This is what brings throngs of Europeans to exhibitions of Mexican art; of Japanese to exhibitions of French art; and millions of Americans to see Van Gogh. This is why the commemorative ceremonies of Rembrandt's death were inaugurated by the last kings of Europe, and the exhibition of our own stained glass by the brother of the last Asian emperor. This is why, Mr. Director-General, so many sovereign names are associated with the appeal you are launching today.

One could not too highly praise your having conceived a plan so magnificent and so precise in its boldness—one might say, a kind of Tennessee Valley Authority of archaeology. It is the antithesis of the kind of gigantic exhibitionism by which great modern states try to outbid each other. Nor should the well-defined object of your

scheme conceal its profound significane. If UNESCO is trying to rescue the monuments of Nubia, it is because these are in imminent danger; it goes without saying that it would try to save other great ruins—Angkor or Nara, for instance—if they were similarly threatened.

On behalf of man's artistic heritage, you are appealing to the world's conscience as others have been doing, this week, for the victims of the Agadir earthquake. "May we never have to choose," you said just now, "between porphyry statues and living men!" Yours is the first attempt to deploy, in a rescue operation, on behalf of statues, the immense resources usually harnessed for the service of men. And this is perhaps because for us the survival of statues has become an expression of life.

At the moment when our civilization divines a mysterious transcendence in art and one of the still obscure sources of its unity, at the moment when we are bringing into a single, family relationship the masterpieces of so many civilizations which knew nothing of or even hated each other, you are proposing an action which brings all men together to defy the forces of dissolution. Your appeal is historic, not because it proposes to save the temples of Nubia, but because through it the first world civilization publicly proclaims the world's art as its indivisible heritage. In days when the West believed its cultural heritage had its source in Athens, it could nonetheless look on with equanimity while the Acropolis crumbled away.

The slow flood of the Nile has reflected the melancholy caravans of the Bible, the armies of Cambyses and Alexander, the knights of Byzantium and Islam, the soldiers of Napoleon. No doubt when the sand-storm blows across it, its ancient memory no longer distinguishes the brilliant notes of Rameses's triumph from the pathetic dust that settles again in the wake of defeated armies. And when the sand is scattered again, the Nile is once more alone with its sculpted mountains, its colossal effigies whose motionless reflection has for so long been part of its echo of eternity.

But see, old river, whose floods allowed astrologers to fix the most ancient date in history, men are coming now, from all parts of the world, who will carry these giants far away from your life-giving, destructive waters. Let the night fall, and you will reflect again the stars under which Isis accomplished her funeral rites, the star of Rameses. But the humblest worker come to rescue the statues of Isis and Rameses will tell you something you have always known but never heard from men before: that there is only one action over which indifferent stars and unchanging, murmurous rivers have no sway: it is the action of a man who snatches something from death.

THE WORLD CAMPAIGN GETS UNDER WAY

SINCE UNESCO's campaign to save the monuments of Nubia was launched on March 8, there has been a growing international response to the appeal by the Director-General. Reports of action taken by governments, institutions and individuals, of measures envisaged or being put into operation in support of the Nubia campaign reach UNESCO daily. Here are a few examples of the kind of help that was being offered to UNESCO as this edition of The UNESCO Courier went to press at the end of March.

★ The International Union of Architects, among whose membership forty countries are represented, has declared its wholehearted support for the campaign.

★ Many offers of voluntary help have been received from individual specialists in pre-history and archaeology. UNESCO is considering how their services can best be fitted into the framework of each nation's share in the campaign.

★ Many young people—students, photographers, artists and archaeologists—have volunteered to form a special group to carry out excavation and protection work. Many of these offers have come from Spain, the United Kingdom and France. So far, however, no plans have been made to set up such a volunteer group for excavation work.

★ The Government of India has offered to send an archaeological mission to Nubia.

● The Documentation Centre on Ancient Egypt in Cairo reports that it needs the services of many specialists to record and copy inscriptions and bas-reliefs and to make photographic and colour-slide records. The Centre is trying to amass as much information as possible about the threatened monuments.

● The Belgian Government has set aside one million francs in its 1960 budget as a contribution to the campaign. This sum will be transferred to the special account opened by UNESCO as soon as parliamentary approval has been given.

● The Bruce Museum of Greenwich, Connecticut, U.S.A. is planning a large scale campaign to raise money in local museums throughout the country and is discussing this project with the American Association of Museums.

● To raise funds for the Nubian Campaign specialists in several countries are to give lectures on the work involved in the "rescue" operations.

Money donated by institutions and private individuals is already reaching UNESCO and is also being sent to the banks in different countries where UNESCO has opened a special Nubia Account. (A list of these banks is published on page 35)

SEARCHES IN THE SAND have recently been carried out in the Aniba region of Egyptian Nubia. A few weeks ago, important disco-

● Acting on behalf of the Swedish National Commission for UNESCO, a Swedish Egyptologist has undertaken a reconnaissance mission in Egyptian and Sudanese Nubia. A similar survey, initiated by the Belgian National Commission for UNESCO, has been made in the Sudan by the Secretary-General of Belgium's Queen Elizabeth Egyptological Foundation, and in Egyptian Nubia by the Director of the same Foundation.

● The University Museum (Pennsylvania University) in the U.S.A. is sending a Egyptologist to make preparatory studies for an excavation mission in Egypt.

● The Egypt Exploration Society of London is now excavating the important site of Buhen in the Sudan and will explore Meinarti when the work at Buhen is finished. It has also asked for permission to excavate at Qasr Ibrim in Egyptian Nubia. The French Government Committee for Archaeological Excavations has asked for permission to excavate the site at Aksha in the Sudan, and an expert from Ghana is now in the Sudan studying the excavation of the site at Serra.

● An exhibition of Egyptology opened at the end of March in the Brussels Palais des Beaux-Arts, the proceeds of which will be given to the Save the Nubian Monuments Fund. It includes many works from museums in Cairo

© Almasy, Paris

Abu Bakr, a Cairo University Expedition is pressing on with excavation work near Aniba, the former capital of the viceroys of the Pharaohs.

veries were made, including an ancient necropolis with well-preserved mummies dating back 5,000 years. Under the direction of Dr Abdel

and Alexandria which are being loaned for exhibition abroad for the first time. The same works will later be on view in other countries.

● In response to the appeal of the Director-General of UNESCO, national committees of action are being set up in several countries:

● In Belgium an action committee is being established under the presidency of Baroness Lambert, and in Spain under Alberto Martin Artajo, Secretary-General of the Council of State. The Federal Republic of Germany has announced the setting up of a similar action committee.

● In the United States, the Cultural Activities Committee of the U.S. National Commission for UNESCO is preparing to set up a national committee of action.

● A short film, made by UNESCO, has been sent to nine major distribution agencies and another, specially prepared for television, has been sent to stations in 28 countries. Production has begun on two filmstrips—one in colour and the other composed of drawings—which illustrate the solutions which are to be adopted to save the monuments of Nubia.

● Radio Geneva has sent a reporter to Nubia to collaborate with UNESCO, in the production of a documentary programme which will be entered for the "Italia" competition. Other documentary programmes are being prepared by missions which the French radio and television organization and the Cologne television station have sent to Nubia. The French TV programme will be offered to stations around the world.

● Later this year UNESCO will bring out a series of colour art slides on the Nubia monuments as an additional item in its collection of colour slides illustrating the world's art.

● An advisory committee of experts has been set up to examine offers of participation and to advise on the allocation of work for safeguarding monuments as well as on the use of financial aid and the distribution of material offered in return for aid.

● A mission, composed of a physicist, a chemist, an architect and a geologist is being set up to study problems posed by the removal of temples (dismantling, transport, reconstruction). From May 15 to September 5 it will study these problems as they apply to three monuments: the temple of Kalabsha, the tomb of Pennut and the Kiosk of Kertassi.

PATRONS OF THE INTERNATIONAL CAMPAIGN TO SAVE NUBIA'S MONUMENTS

King Gustaf VI Adolf of Sweden

Queen Frederika of Greece

Crown Prince Merid Azmatch Asfa Wosen Haile Selassie of Ethiopia

The Prince of the Netherlands

Princess Chams Pahlavi of Iran

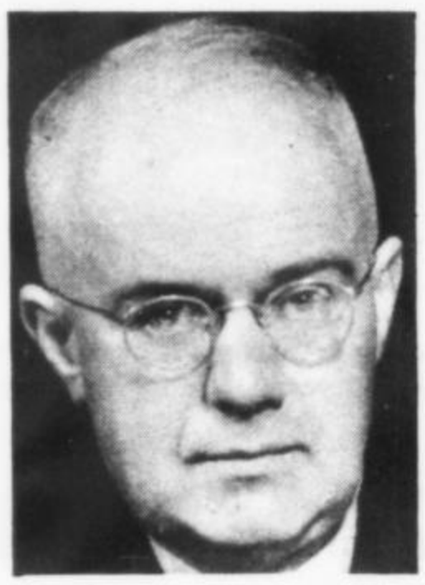
Prince Mikasa of Japan

The Duke of Devonshire

Theodor Heuss, former President of the Federal Republic of Germany

Eduardo Santos, former President of Colombia

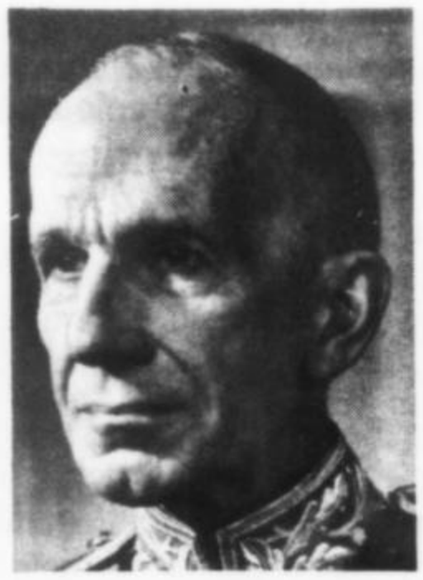
Cardinal Eugène Tisserant, Librarian and Archivist of the Vatican Library



Oscar Lange, Deputy Chairman of the Council of State, Poland

Sir Sarvepalli Radhakrishnan, Vice-President of India

Victor-Andrès Belaunde, Peru, former President of the General Assembly of the United Nations



Vincent Massey, former Governor-General of Canada

Ramon Menendez Pidal, Spain, Chairman of the "Real Academia Española de la Lengua"

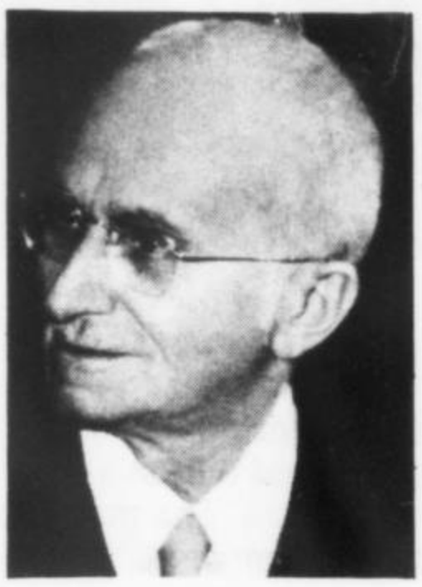
Dag Hammarskjold, Secretary-General of the United Nations

Jaime Torres-Bodet, Minister of Education, Mexico; former Director-General of Unesco

Queen Elizabeth of Belgium

Princess Grace of Monaco

Mrs. Franklin D. Roosevelt



Senator Luigi Einaudi, former President of Italy

Serge Kaftanov, Chairman of the State Committee for Broadcasting and Television of the U.S.S.R.

André Malraux, Minister of State in charge of Cultural Affairs, France

Sir Julian Huxley, former Director-General of Unesco

Luther H. Evans, former Director-General of Unesco

INTERNATIONAL COMMITEE OF ACTION

Hermann Abs, Director-General, Deutsche Bank, Frankfurt-am-Main
F. de Assis Chateaubriand Bandeira de Mello, Brazilian Ambassador to the United Kingdom
Carl Burckhardt, former Minister of Switzerland to France, ex-President, International Committee of the Red Cross
Emir Maurice Chehab, Director-General of Antiquities, Lebanon.
T. Kotarbinski, President of the Academy of Sciences of Poland
Ignacio Marquina, Secretary-General of the Pan-American Institute of Geography and History
Alberto Martin Artajo, former Minister of Foreign Affairs, Spain
The Nawab Mir-Khan, Ambassador of Pakistan to Portugal
B. Patnaïk, founder of the Kalinga Prize for Popularization of Science
Jacques Rueff, Member of the Institut de France
Serge P. Tolstov, Corresponding Member, U.S.S.R. Academy of Sciences
Count Leonardo Vitetti, Italian Ambassador to France
Sir Mortimer Wheeler, Former director, Society of Antiquities; Professor of Archaeology, London University
All Chairmen of the National Committees.

STAMP HONOURS UNESCO'S NUBIAN CAMPAIGN

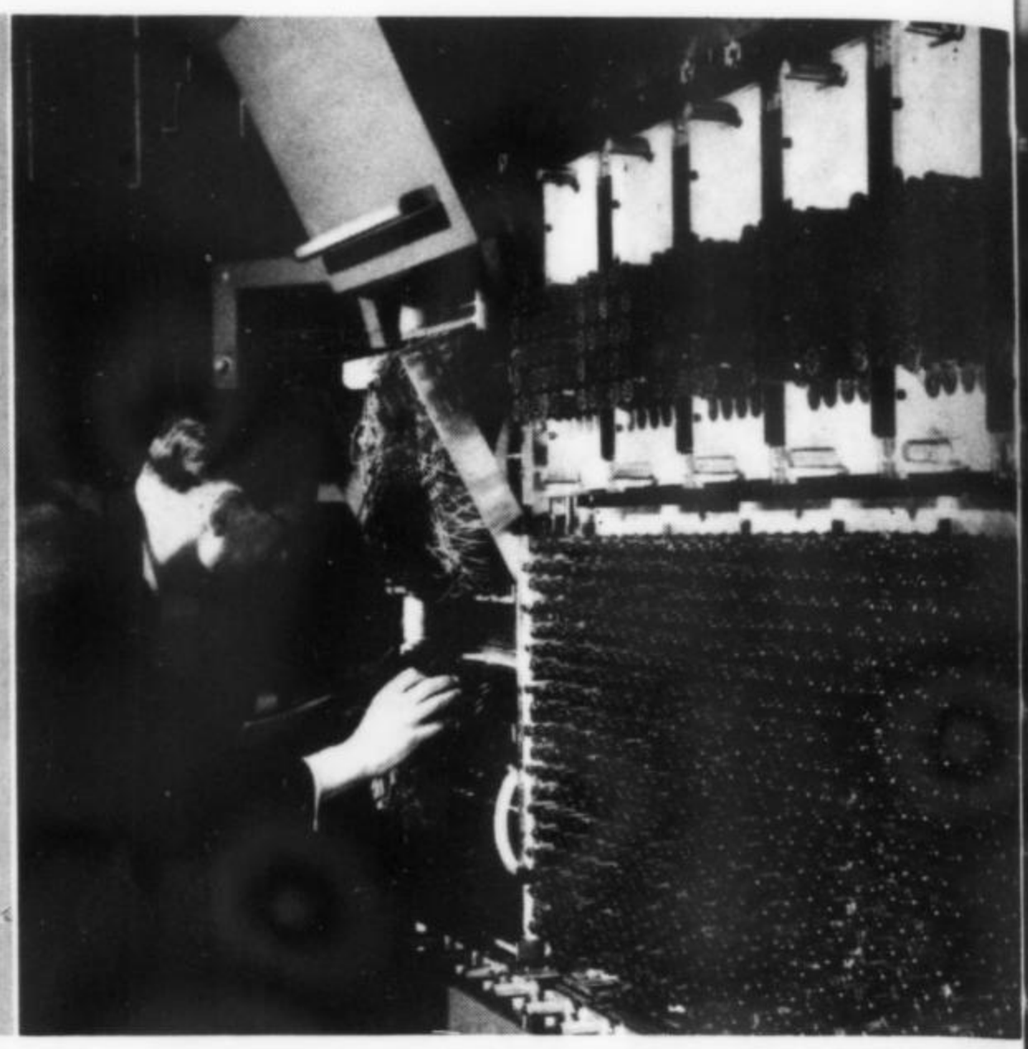
Egypt has issued a large 10-mills stamp to commemorate the launching of Unesco's campaign to save the monuments of Nubia. The stamp depicts the rockhewn facade of the Great Temple of Abu Simbel, with its massive sandstone statues of Rameses II. This stamp is on sale at the Unesco Philatelic Service, Unesco House, Place de Fontenoy, Paris. (See also page 34)

Two other new Egyptian stamps (below) celebrate the inauguration of the Aswan High Dam. One shows a view of the Dam while the other is in the form of a miniature poster giving, in Arabic and English, brief facts to highlight the importance the Dam will have for the future economy of the Nile Valley.

THE SHAPES OF THINGS TO COME

by

Ritchie Calder



How is it that its potential victim can recognise a buzzard by its shape or shadow, and take evasive action? How can a small boy tell you the name of an aircraft flying high overhead? Or, for that matter, how do we recognise "A" as the first letter of the alphabet? Or how can we distinguish a Southern drawl from a Brooklyn accent, or a word spoken in French from a word spoken in Russian?

It is done by "pattern identification", the recognition of a visual image or the form of a sound. It depends on remembering shapes, or sounds, comparing them with others and associating them with concepts. The alphabet is a visual imprint in our memories. We have stored away in our brains sounds which we can cross-refer to other sounds and associate them with accents or languages which we hear.

"Pattern identification" was one of the subjects most earnestly discussed at the International Conference on Information Processing, organised by UNESCO in Paris last year and attended by 2,000 experts from 37 countries.

This meeting of "The Computer People" (as they call themselves) was concerned with the remarkable machines which can do incredible sums at fantastic speeds; have prodigious mechanical "memories" which can store information; can be taught to think; can control other machines; send artificial satellites into orbit, or rockets to the moon; and translate one language into another.

All these things are done by what is called "programming". The experts work out the ways in which information can be stored in the machines and instructions about how that information can be used or recovered. A programme is a numerical code, like a secret service cipher which the electronic brain-cells can unravel. The information and instructions have to be fed into the machines as punch-cards or punch-tapes. This means that while the electronic part of a computer can handle at least 10,000 "bits" of information in a second, a great deal of time has to be spent in working out the programme and punching out the instructions.

If text in (say) French is to be translated into (say) Russian it has to be typed out on a machine which converts it into punched symbols. The machine then analyses this punched information, compares the words it has been given with the comparative dictionaries which have been similarly punch-fed into it. It makes the translation again on to tape which operates an electric typewriter and produces the Russian in readable form.

The ideal, of course, is to confront the machine with the actual written page and have it quickly reproduce the translation as another printed page. It would be even more useful if it could take a voice speaking in French and translate the language either as a Russian text or as an artificial voice speaking in Russian.

But that, at the moment, in the language of "The Computer People" is just "blue sky"—talking about what one wishes to happen. Nevertheless, the discussions at the UNESCO conference were optimistic about the technical possibilities. In the past twelve years, "The Computer People" have increased from a handful to hundreds of thousands. Their computers have been transformed from devices for doing arithmetic into thinking machines, with faculties uncannily human. It is only a matter of time before they acquire "pattern identification".

What does it involve? There is no difficulty about electronically seeing and conveying an image. That happens in television. The camera records the image, converts it into electrical signals which are transmitted and reassembled on the television receiver screen. The human viewer does the "pattern identification". The radio and the telephone converts the spoken word into signals which are reconstituted as the identical voice at the other end. But the human listener does the "pattern identification".

Images and voices can be memorised electronically. The television pictures can be stored, not just as visible film as in the cinema but as the recording, on magnetic

Photos ILO

tape, of the signals which, reactivated, will faithfully reappear as a picture on the television screen. The same, of course, is true of tape recordings of voice "patterns".

ANOTHER remarkable advance is a device which takes a voice, analyses its frequencies and expresses them as a code, like sending a telegraph message instead of a telephone voice. This code is then deciphered at the other end and the receiving machine reproduces the code as an artificial voice. It is not the voice of the original speaker but it can be coded even to convey an accent; it can be recognisably Scottish, for instance.

That is another step towards "pattern identification". "You say 'tomahto'; and I say 'tomato'," (In the words of the song) or the French say "formidahble" and I say "formid'ble". And the voice-coder can tell the difference.

The technical difficulties are, however, formidahble (or formid'ble) because for identification purposes the machine has to have a memory which not only stores images but can compare them—associate them with the ideas which they represent. It has not only to recognise the letter "A"; it has to realise that it is the first letter of the alphabet. Or "2" is no longer the number with which the digitical computer is familiar; it is an image which has to be built up. In arithmetic "2" is 1 plus 1—three "bits" of information but as the Japanese scientists, reporting on their work on "pattern identification" at the UNESCO conference, pointed out, the image "2" needs 120 "bits" of information to make it identifiable.

As scientists working on recognition of speech by machine at the Massachusetts Institute of Technology, U.S.A., told the conference, the analysis of speech is like chemical analysis; its substance has to be broken down into its constituent parts. The constituents of the spoken word must be constants no matter in what "formula" or in what language they are assembled. But a voice-prescription is more difficult than the chemist's formula. A machine to be effective will have to translate not only syllables but the inflection—the sneer, or the good-humoured laugh, which makes all the difference in the intention of the speaker.

'FEEDING' A COMPUTOR. Whether they are required to do incredible calculations at fantastic speeds, run factory production lines or translate one language into another, computing machines must first be "fed" with information and instructions. Programming, as this is known, is done on punch cards or punch tapes. Here (above left) a specialist prepares a computor for a complicated task by combining certain of its cables. After the initial work has been done, the computor will not only carry out the task that was fed into it on tape, but also control constantly the performance of its work. Today many industrial products are being fabricated by means of automation. In this automated German thread-producing plant (above right) only a small staff is required to control the entire flow of production.

Apart from the value of "pattern identification" in the ultimate translation of languages, there is the mathematician's concern that the computer should be able to cope with geometrical shapes as it has done with arithmetical equations and, preferably, in three-dimensions.

ONE immediate, and not too difficult possibility in "pattern identification", is in abstracting. The machine is being taught to glance at a scientific paper and select the parts which identify the authors and the sentences which would give the essence of the account.

Nowadays, some 3,000,000 original scientific papers are published in over 40,000 scientific journals every year. It is becoming almost impossible to cope with this Niagara of information.

Once the machine has been taught not only to memorize but to extract and translate the significant material it will make the information easily and quickly accessible to those who need it and who can act upon it. The awesome truth is that this will produce more discoveries and more papers—and more machines to cope with them.

BUDDHIST ART OF JAPAN

A NEW album—Japan: Ancient Buddhist Paintings —has now been published in the UNESCO World Art Series.

Devoted to paintings inspired by Buddhism in Japan from the 8th to the 12th Centuries, this album contains an impressive overall view of this Japanese art, both refined and vigorous, which runs from mystical images to realistic portraits. They are basically religious paintings preserved in Japan's oldest monasteries; but despite this (or perhaps even because of their nature) they speak a very human language which can be understood today by the connoisseur and the layman alike.

The history, the interpretation and the technique of the paintings are described in a preface by Serge Elisséeff, director at the Ecole des Hautes Etudes in Paris and honorary professor at Harvard University, and in an introduction by Takaaki Matsushita, a research officer with the Japanese Commission for the Protection of Cultural Property.

This album, which costs $18.00; £6. 7s or 88.50 NF, contains 32 full-page colour reproductions and is published—as are all the UNESCO World Arts Series albums—by the New York Graphic Society by arrangement with UNESCO. These albums offer high-quality colour reproductions of works of art previously not well-known outside their countries of origin.

They can be obtained from agents of the New York Graphic Society whose addresses, in the following countries, are: *Australia:* Melbourne University Press, Mr. Roger Page, 369 Lonsdale Street, Melbourne C.i.; *Canada:* Burns & McEachern, 12 Grenville Street, Toronto; *England:* Studio Books, 161-166 Fleet Street, London E. C. 4.; *France:* Ed. Braun & Cie, 18 rue Louis le Grand, Paris (2e). Special terms are offered by these agents to educational and cultural institutions.

A list of agents throughout the world can be obtained from the New York Graphic Society, 95 East Putnam Avenue, Greenwich, Connecticut, U.S.A. In countries where there are no agents, UNESCO World Art Series albums can be ordered from UNESCO's National Distributors whose names are listed on page 33, or from leading booksellers.

EXCITED CROWD watching a fire is a detail from a 12th Century Japanese scroll painting. It was in this period that paintings devoted to secular subjects, intended for pure artistic appreciation, made their appearance. The story illustrated here covers three scrolls. It tells of the conspiracy of a courtier, Tomo-no-Yoshio, who set on fire the Imperial gate so he could falsely accuse a political rival. But his crime was detected and he was exiled. In the case of scroll paintings illustrating legendary and historical subjects, the artists were able to give free rein to their artistic imagination. Nothing escapes the observant eye of these Japanese painters who depict the weaknesses and mishaps of their fellows with a host of picturesque details.

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The Lives of Buddha in 'Past and Present Worlds'

Soon after the triumph of Buddhism in Japan in 587 A.D., the Imperial Court sent to Korea for Buddhist monks who came accompanied by craftsmen—carpenters, sculptors, tile-makers and painters. The Japanese familiarized themselves with the new crafts but also managed to preserve their own peculiar skill and national taste. Growing interest in Buddha and in his life and his sacrifices in previous existences, also spread to art. Thus scroll painters depicted episodes in the life of Prince Siddharta (later the Buddha Shaka) and illustrated the scripture describing the lives of Shaka in the "past and present worlds". Above, part of a scroll showing Prince Siddharta riding out of his palace. Below, the Prince enjoying sport in the palace. Figure, opposite page (and also the one on page 22) are from the famous "Nirvana", dated 1086. The full work shows the Buddha Shaka (Sakyamuni) on his death-bed with heavenly and earthly beings around him.

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RICE BALES TAKE WING

Above, part of a 12th century scroll illustrating miraculous stories concerning the monk Myoren, a mountain-dwelling hermit. Scene reproduced here is from the Legend of the Flying Granary. It shows rice bales flying out of a granary which Myoren has brought by air to his mountain home. (See also page 24). Figure, opposite page, is a mourner at the death-bed of Buddha—a detail taken from the Nirvana scroll.

MONK WITH MAGIC POWERS

An alms bowl sent through the air by the magic power of Myoren the monk (see previous pages) carries back to his cottage the granary of a rich landlord before the eyes of the astonished villagers (above). Left, a detail from same scene.

CHINESE MODEL, JAPANESE STYLE

Painting of landscape with figures (right) was executed in the 11th century on a silk screen which served as a background for initiation to esoteric Buddhism. It was painted after a Chinese model, but shows development of a tendency towards an intrinsic Japanese taste.

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MOVING DAY FOR AN ARCTIC CITY

by John Drummond

Canadian Embassy, Paris

CONFUSED PATTERN of lakes and rivers interspersed by patches of spruce forest seen in aerial view (left) of the Mackenzie River delta in North West Canada explains why Aklavik, Canada's largest Arctic town, has been called the "Venice of the far North." Built on a bank of frozen silt and ice (above) jutting into the west channel of the 2,500-miles-long Mackenzie, Aklavik is literally resting on water. Its frozen foundations melt in summer and the river is "chewing" at the site. The entire city is now being rebuilt on a new site 70 miles away on the east channel of the Mackenzie. Buildings of the new city, Inuvik, seen in air view (below) are constructed on stilts.

Northern Affairs and National Resources, Ottawa, Canada

THIS is the story of a small community in the frozen lands of the Canadian Arctic which had to choose between a removal "lock, stock and barrel" to a new site or staying put and seeking by devious and expensive means to stop the "city" from sinking below the level of the river upon whose "floating" banks it had been built.

Aklavik began its life in 1912 as a trading post. It lies on a bank of frozen silt and ice jutting into the west channel of the Mackenzie River. "From the air", writes a Canadian government official, "one looks down on a vast confusion of lakes stretching over the horizon and laced together by dark green patches of spruce forest. Below, the brown waters of the Mackenzie wind down to the sea. Far in the distance is the ocean on the north, and the peaks of the Richardson Mountains form a backdrop in the west."

Established as a trading post to deal in the furs of the muskrat, Aklavik also became a natural centre for the people of those parts of the Northern Territories; indeed, its growth had a special significance because it was one of the few places in Canada where whites, Eskimos and Indians lived and worked happily side by side.

With the passage of time Aklavik grew in importance. By the mid-twenties a Royal Canadian Mounted Police post, Anglican and Roman Catholic Missions, and a station of the Royal Canadian Corps of Signals had been established there. Its medical and educational facilities likewise increased, until Aklavik was the principal administrative centre and the most important community within the Arctic Circle.

Surprisingly, the climate of the Aklavik region is relatively pleasant considering it lies about 100 miles north of the Arctic Circle. Although the winters are long, lasting at least seven months, annual snowfall is but moderate and the low temperatures are bearable. Summers are short and warm.

ONE thing, however, spoils Aklavik. The city (having a cathedral it can claim to be a city) is built on permafrost, a mixture of frozen silt and ice—more ice than silt. The top or "active layer" of two or three feet thaws in summer and freezes again in winter. Below that the ground is permanently frozen to a depth of about 1,000 feet. When the sun and heat from buildings melts the ice in the soil, the water is unable to drain away and so great pools form surrounded by thick mud. Hence, Aklavik has been derisively called "The Mudtropolis of the Arctic"!

Mud apart, Aklavik is literally resting on water! Moreover, the Mackenzie river is "chewing" at the site and threatens to sweep it into the Beaufort Sea. With its foundations melting away and river erosion constantly at work, Aklavik by the early 1950's was a community without a future. Even if, at enormous expense, these two great obstacles to development could be overcome, the construction of sewers, water mains and roads, the

CONTINUED ON NEXT PAGE

laying down of an airfield and other vital aspects of reconstruction in a growing community, all combined to pose colossal problems and to create prospects of enormous expenditure.

In what way, then, could Aklavik expand? Neither vertical nor horizontal growth was possible on such unstable foundations. It became obvious as time passed that new construction and reconstruction—some government, some private, some missionary—would have to be undertaken.

THE position became so untenable that the Canadian Government decided to move Aklavik, and in 1954 a survey team was organized to find a suitable site. Eleven criteria were set up by which potential sites were to be judged by the team. The official report records: "The new site was to be a place conducive to orderly, efficient and economical town planning. The ground would have to be suitable for permanent sewer and water systems, foundations and roads, and there would have to be a good site for an airfield."

This was especially vital because Aklavik is cut off from the rest of the world for some six weeks or more each year, during break-up and freeze-up; planes are unable to land, ships are blocked by ice, and dog teams are not able to cross the inhospitable terrain. Nobody can get in or out during that time, which may easily last for three months of each year.

The site would have to allow for adequate sewage disposal and sand and gravel for building purposes would have to be accessible. It would need to be located where it could act as a transhipment point from river to sea-going vessels. It was hoped that wood, coal and hydro-electric power would be reasonably accessible also.

The survey team set out in March 1954, and established their first base on the Husky Channel. Preliminary aerial surveys had located nine possible sites for the new Aklavik, but ultimately all but one—known as East 3—were discarded.

This elimination process itself posed much work and strain on the team, since it meant moving base four times. We glimpse some of the difficulties and hardships from the fact that their camp needed tractor trains, snowmobiles, dog-teams, scows, barges and light river craft to move it, depending on the season.

SITE East 3 was found to fill all the essential and desirable requirements. It lies on the east bank of the east channel of the Mackenzie River, 70 miles by water from the old Aklavik but only 35 by air. The site cannot be endangered by flooding or erosion, though it lies on a navigable river channel, hence the new Aklavik (or Inuvik as it has now been named) will be able to expand as Canada's thriving economy so demands.

Yet the problems facing the builders of this new town still appeared insurmountable. Almost every aspect of construction—roads, buildings, sewers and waters mains—presented a challenge to ingenuity.

For instance, how could new roads be constructed without destroying the all-important insulating cover of moss, often a foot or more thick. If the moss were removed the permafrost beneath would inevitably melt to a depth of several feet each summer, the soil would then become unstable and the road itself, subject to periodic thawing and freezing, would be virtually ruined. Roads also need to be drained, but the removal of the moss made the digging of ditches impossible.

The solution, proved under trial, was found by laying gravel on top of the moss, in some parts supplemented by a protective layer of brush from cleared land. The roads were planned also to follow the natural contours of the land, so that draining could be achieved by "run-off".

The engineers then turned their attention to the construction of buildings. They had to find a method of construction which would not cause the permafrost under the foundations to melt from the heat of the buildings. The answer was to build the larger buildings on wooden piles, driven some 20 feet into the ground. Smaller buildings, including dwellings, could be built on top of a two-foot gravel pad laid on the moss. Each method permits air circulation to disperse the heat from the buildings, thus protecting the foundations from the threat of melting permafrost.

So Inuvik will ultimately be a town on stilts.

EVENTUALLY, the problem of how to build water and sewer mains which wouldn't freeze—remembering the permafrost extends about one thousand feet downwards—was ingeniously solved by using "Utilidors". These are large, insulated, box-like enclosures on stilts, through which the water and sewer pipes run above the ground. To prevent the water from freezing, however, a pipe to carry hot water throughout the town from a central heating plant was added, thereby providing for every home and building not only adequate sanitary and fresh water facilities, but central heating as well!

Yet even this clever solution in turn posed a new problem —each time a road and a Utilidor have to cross one another a bridge is needed. And bridges are expensive. The answer lay in planning the system of roads and Utilidors to have as few crossings as possible.

The new town, then, will be one comprising buildings on stilts, and houses without furnaces and without chimneys. All will enjoy the luxury of central heating, hot and cold running water, and modern sanitation—all of which were lacking in the old town.

Already much of this work has been completed, including the construction of a 25-classroom school with boarding accommodation for 500 children, offering secondary education to Eskimo, Indian and white children working and playing together. In 1960 construction will include accommodation for the Royal Canadian Mounted Police and the Department of Transport, the Northern Affairs

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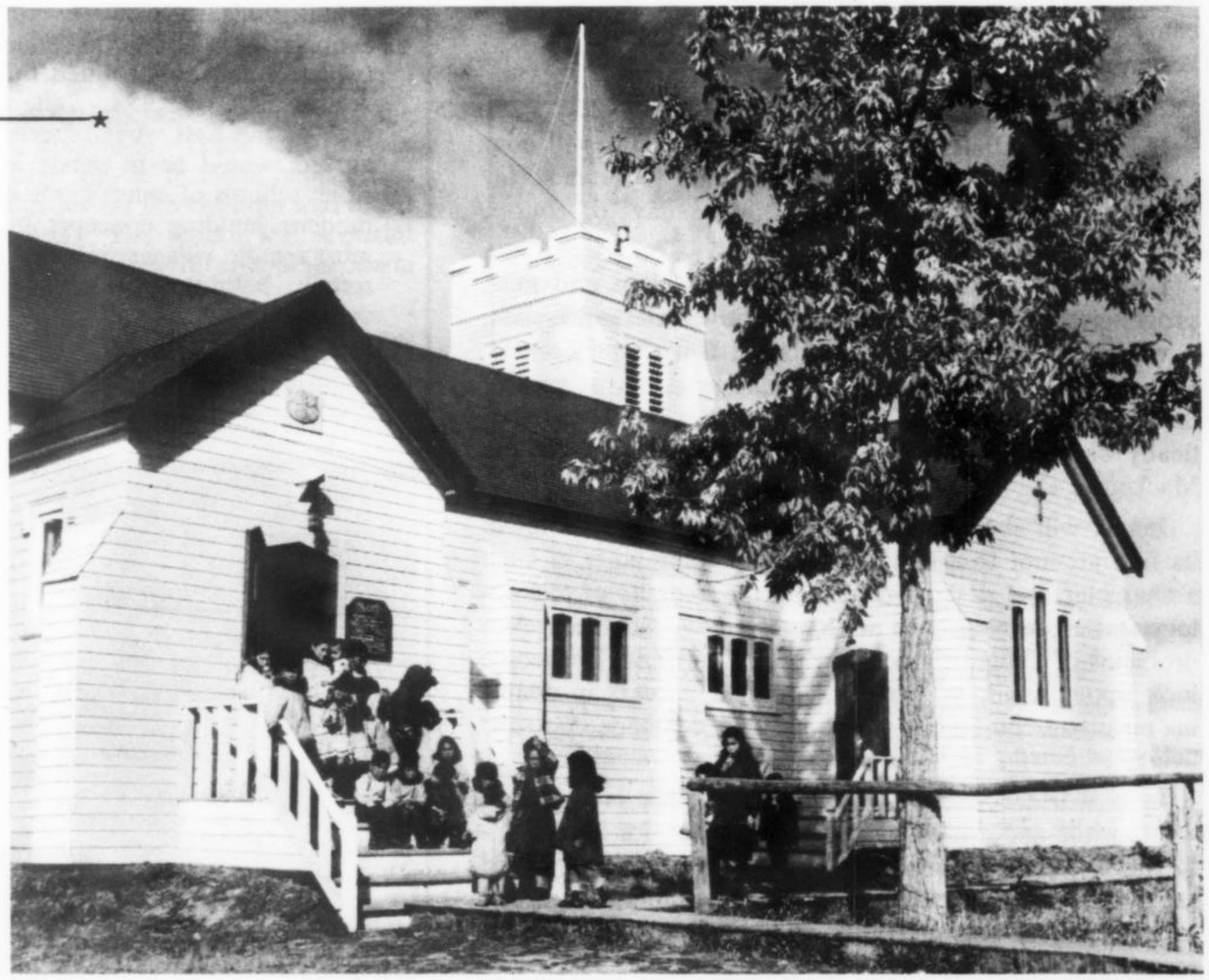
National Film Board

A DOOMED COMMUNITY only a few years ago, Aklavik is today building a firm future. Its people are helping to put up new homes at Inuvik and at the same time learning new trades and skills to replace fur trading, no longer a stable occupation. For the children (above) a 25-classroom school offering secondary education to Eskimo, Indian and white youngsters has already been built. Below, All Saints Cathedral at the old townsite of Aklavik. In progressive stages worth-while buildings are being moved to the new town some of them being towed in one piece by tractor down the frozen surface of the Mackenzie River.

Northern Affairs & National Resources, Ottowa, Canada



ARCTIC CITY *(Continued)*

Administration Buildings and staff houses, and an 80-bed hospital.

But Inuvik will also enjoy the facilities of an airport costing more than $5 million, with a regular passenger and air mail service. Telegraph and telephone services as well as a radio station will also be available, while modern methods of garbage-disposal will replace the crude "methods" of the old Aklavik.

Having been planned with long-range growth in view, Inuvik will have a potential of about 5,000 residents, compared to the far smaller population of the old town.

Possibly one of the most useful and significant aspects of this project is that it is being used as a training programme to provide vocational skills to Eskimos, Indians and others living in that region. This is especially important since the fur trade, which originally forged Aklavik as a trading post, is no longer a stable occupation, and new trades and skills must be learned. So these people, many of whom had their homes in old Aklavik, are building their own "replacement" town while simultaneously learning to be carpenters, bulldozer operators, truck drivers, electricians, engineers, and skilled workers of other kinds.

BECAUSE the new town is in itself an education and employment plan, it is taking longer to build than was strictly necessary. Yet this is seen to be a good thing, in the long-term view.

In progressive stages, worth-while buildings are being moved from the old site to the new one, some simply being towed in one piece by tractor down the frozen Mackenzie river.

And what of the rest of doomed Aklavik?

It is thought that some Eskimos and Indians will continue to live there because they don't want to move so far from their muskrat trapping line. One day ,of course, they will be forced to leave the sinking city. . .

Ultimately, Inuvik will be the most modern and most progressive town north of the Arctic Circle. As such, it will be an important transportation and trading centre. Federal government officials will administer a vast area of the Northern Territories from this town. It will automatically become the centre of the trapping industry of the Mackenzie Delta.

Inuvik will also be Canada's first modern Arctic town, its first attempt to establish an Arctic community of such a character and design wherein all the benefits of technology and modern science are harnessed to meet the ageless problems of living in a cold region. The Canadian people look upon Inuvik as a symbol of their success in adapting an urban community to the peculiar demands of Arctic living.

In a world so short of living-space, this is indeed a worth-while and a highly significant project, for it pointedly suggests that all kinds of people can carve a new and satisfying life for themselves in regions hitherto regarded as inhospitable and unworthy of settlement and development.

ONE THOUSAND NEW SCHOOLS FOR POLAND'S 1,000TH BIRTHDAY

by Tadeusz Barucki

MANY countries today are facing the problem of school construction: everywhere the school-age population is increasing enormously, and nearly everywhere there are too few schools to meet present needs.

In Poland this problem is especially acute, not only because of population increases but also due to the mass destruction that occurred during the war. Its solution calls for the co-operation of the entire nation.

With this in view, a construction campaign, "1,000 Schools for the 1,000th anniversary of the Polish State" (which is to be celebrated this year), was launched in the second half of 1958. The idea received wide acclaim. One of the best ways of celebrating the millenary, it was agreed, would be to create as many new schools as possible; schools of avant-garde design which would introduce modern building concepts into little towns and into the most remote villages; schools that would provide a pleasant setting, helpful to teaching and to the development of culture.

A great campaign was quickly prepared: all over the country, committees were set up and contributions pledged

PLAYTIME at Czeladz (above right), in one of many schools that have been built recently to commemorate the 1,000th anniversary of the Polish State. Right, scale model of one of the new schools which have been constructed thanks to a nation-wide campaign.

Unesco

—gifts of money, of building materials, of hours of work. In November 1958, a national committee for the school building fund had been organized, and this group had the task of co-ordinating the various activities of the campaign.

The Association of Polish Architects responded immediately to the appeal. Its members collaborated with the official agencies in selecting "prototypes" for future buildings from among plans already drawn up.

This first phase of the work was followed, in the middle of 1959, by a competition for the design of a school for country districts or small towns. Besides classrooms, this school would have social and cultural facilities, such as a library, reading room, lounge, etc. In small communities, these premises could form a cultural centre—often the first available—for those who had already finished school or had not had time to complete their studies.

Eight prizes and several commendations were awarded in this competition for the ten projects exemplifying the most modern architectural concepts. These will provide a new background for daily life, a modern one certain to have an educational influence on the children and affect their tastes and their interests. The school will acquaint them with new ways of life which will encourage them to improve their surroundings.

Modernism in architecture, however, is not always immediately accepted, and there must be a carefully thought out effort to popularize it among those interested in the schools—among teachers, helpers, parents' associations, and even among those drawing up the projects.

So the Association of Polish Architects has organized in Warsaw and in several provincial centres exhibitions and discussions on the development of modern architecture, comparing old and new methods of building and equipping schools. The Warsaw press, giving much space to the campaign, has helped to develop popular interest in the problems.

The organizers endeavoured to offer the most abundant and diverse information on the subject, for the sake of useful comparison. They staged an exhibition of school design executed in the United States, which, despite

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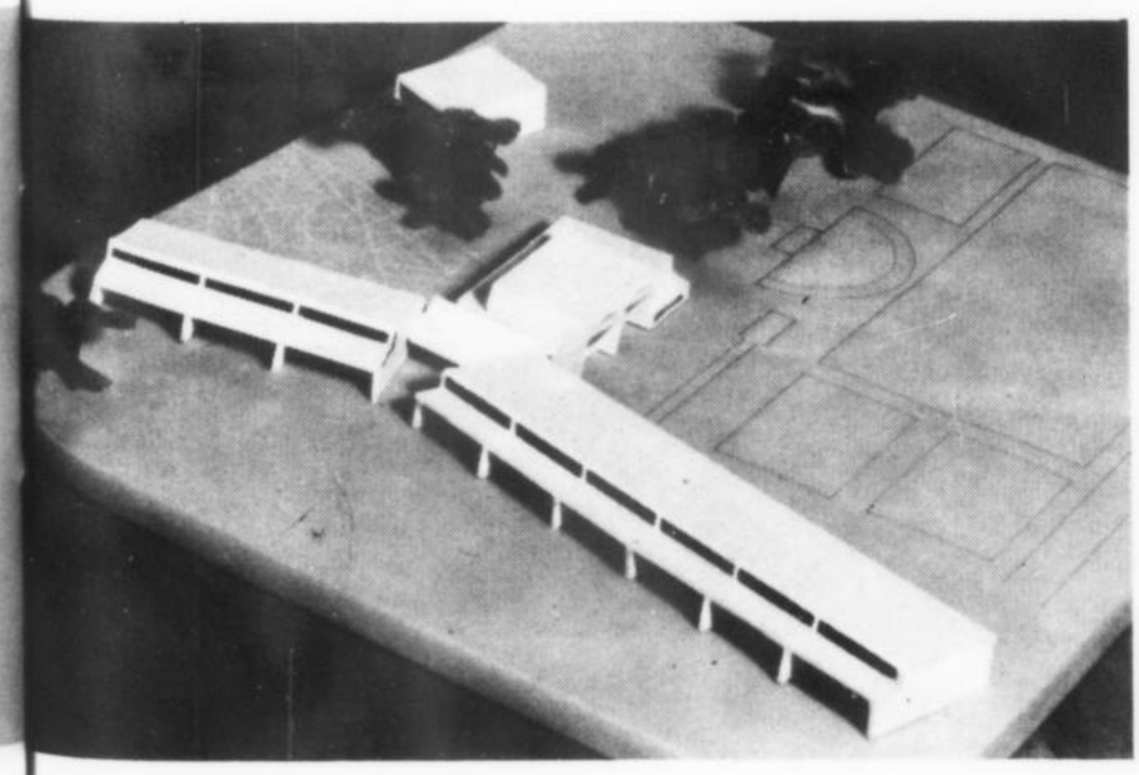


THEY HAD THE RIGHT IDEA IN 1775

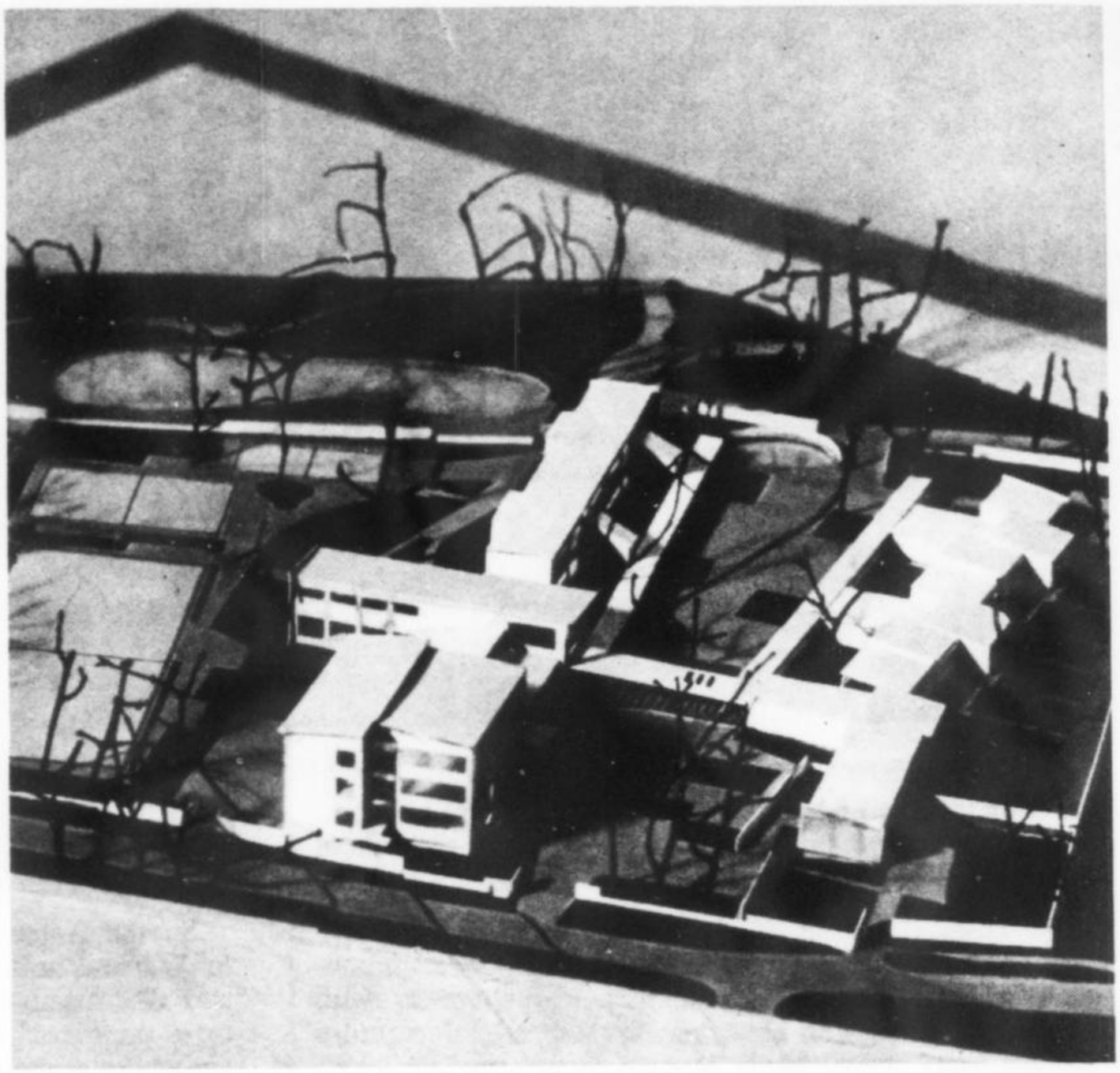
One of the first actions of the Polish National Education Committee after its foundation in 1775—the Poles regard it as the world's first Ministry of General Education—was to lay down certain standards for the construction of school buildings:

"Classrooms should be spacious, well lighted and equipped with a chimney and good stove; they should have a pleasant appearance, the walls being decorated with pictures, plans of cities, etc; they should always be kept clean so that children think of them not as a prison, but as an agreable second home."

It is interesting to compare these standards laid down nearly 200 years ago with the stipulations given in the report on school buildings which Unesco received a few years ago from the International Union of Architects:

"The majority of current ideas in education should be allowed to carry their full weight in the determination of architectural practices—teaching should be adapted to the mentality of the child and therefore architecture, adapted to the measure of a child who is simultaneously developing his body, his intelligence and his personality, should be pleasant and varied. School should be an extension of the home. Education should respect the creative ideas of the child and architecture in its turn should be simple and real, eschewing all artifice."

PLENTY OF AIR LIGHT & WIDE OPEN SPACES



Every type of building is included in Poland's present school construction programme—from seven-class village schools to secondary and technical training establishments. Model of 15-classroom primary school for Kielce-Szydlowek (right) embodies design of individual rooms linked by passages. Below, a 22-classroom school designed for the town of Zielona Gora. In country districts schools also serve as social and cultural centres. Modern designs offer a new background for daily life.

Photos I. Jarosenka

differences in administrative principles, syllabus, geographic, social and economic conditions, aroused lively interest and led to a useful exchange of ideas.

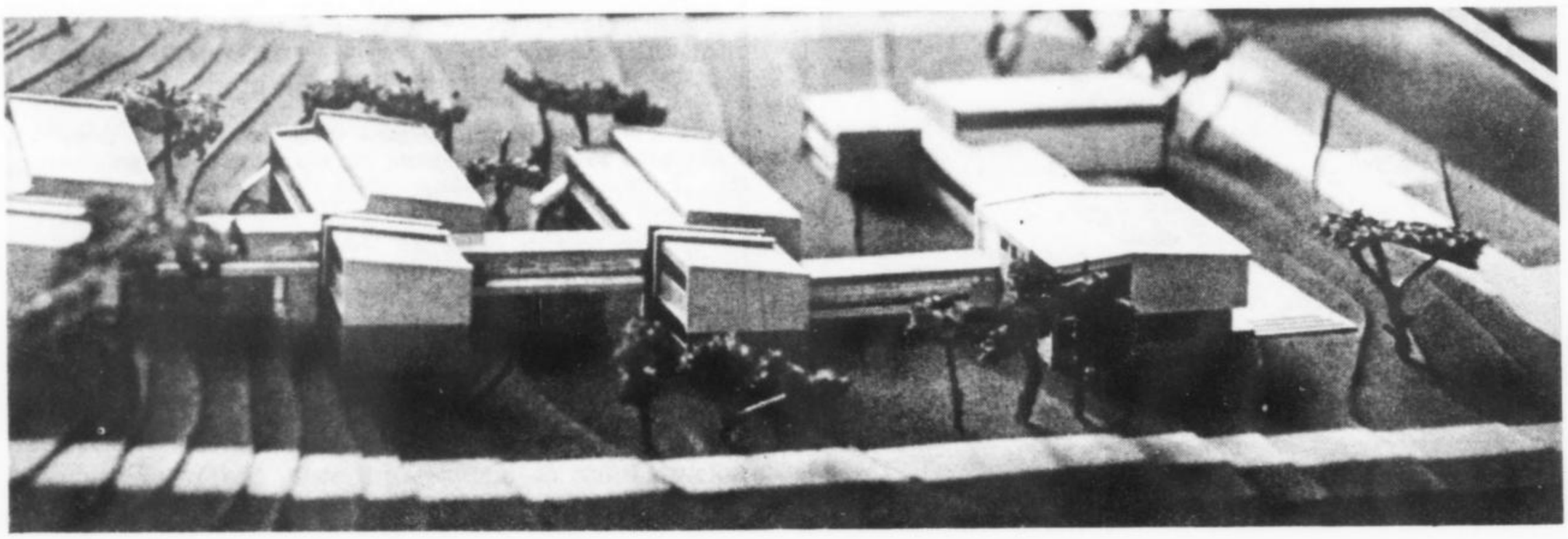
Useful exhibits and information were also provided by the Union of the Federations of Yugoslav Architects, which devotes much attention to school building programmes.

Polish architects living abroad co-operated in the campaign, either by taking part in the competition or, as did those in London, by sending in their name and that of English colleagues, 14 designs together with complete technical details.

Architects in Poland have accepted to draw plans for schools free of charge. Their association is in constant touch with organizations engaged in school construction, and is participating in the work of the school building commission of the International Union of Architects. Thus it has available the latest information on new construction throughout the world. The International Union of Architects, of which the Polish Architects' Association is a member, was able to offer useful recommendations embodying the latest ideas in school design and construction. The scope of this contribution, of which the Polish architects made good use, was especially broad as the International Union's activities and contacts are worldwide.

The Association is also consulting UNESCO to obtain full documentation on school construction in countries where the problem has already been solved.

The "1,000 Schools" campaign is now in full swing. On September 1 1959, anniversary of the outbreak of the second world war, which arouses in us such painful memories, already the doors of many new schools were opened for the first time to a generation of children who are now just beginning their studies, and who will have the task of building the world of tomorrow.



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BURMA. — S.P.C.K. (Burma) 549, Merchant Street, P.O. Box 222, Rangoon.

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CEYLON. — The Associated Newspapers of Ceylon Ltd, Lake House Bookshop, 100 Parsons Road, P.O. Box 244, Colombo, 2. (Rs. 9).

CHINA. — World Book Co, Ltd., 99 Chungking South Rd., Section 1, Taipeh, Taiwan (Formosa).

CUBA. — Libreria Economica, Pte Zayas 505-7 Apartado 113, Havana.

CZECHOSLOVAKIA. — Artia Ltd., 30 Ve Smeckách, Prague 2.

DENMARK. — Ejnar Munksgaard Ltd., 6 Nörregade, Copenhagen K. (D.kr. 12).

ETHIOPIA. — International Press Agency, P.O. Box 120, Addis Ababa.

FINLAND. — Akateeminen Kirjakauppa, 2 Keskuskatu, Helsinki. (F.mk. 540).

FRANCE. — Unesco Bookshop, Place de Fontenoy, Paris, 7e. C.C.P. 12598-48 (7 NF.).

GERMANY. — R. Oldenbourg K.G., Unesco-Vertrieb für Deutschland, Rosenheimerstrasse 145, Munich 8. (DM. 6).

GREAT BRITAIN. — See United Kingdom.

GREECE. — Librairie H. Kauffmann, 28, rue du Stade, Athens.

HONG-KONG. — Swindon Book Co., 25, Nathan Road, Kowloon.

HUNGARY. — Kultura, P.O. Box 149, Budapest, 62.

INDIA. — Orient Longmans Private Ltd. Indian Mercantile Chamber, Nicol Road, Bombay 1; 17 Chittaranjan Avenue, Calcutta 13; Gunfoundry Road, Hyderabad, 1; 36a, Mount Road, Madras 2; Kanson House, 24/1 Asaf Ali Road, P.O. Box 386, New Delhi, 1; Sub-Depots: Oxford Book & Stationery Co., Scindia House, New Delhi; Rajkamal Prakashan Private Ltd., Himalaya House, Hornby Road, Bombay 1. (Rs. 6.70).

INDONESIA. — G.C.T. Van Dorp & Co., Djalan Nusantara 22, Posttrommel 85, Djakarta.

IRAN. — Iranian National Commission for Unesco. Avenue du Musée, Teheran.

IRAQ. — Mackenzie's Bookshop, Baghdad.

IRELAND. — The National Press, 2, Wellington Road, Ballsbridge, Dublin. (10/-)

ISRAEL. — Blumstein's Bookstores Ltd., 35, Allenby Road and 48, Nahlat Benjamin Street, Tel-Aviv (1£ 4.-)

JAMAICA. — Sangster's Book Room, 91 Harbour Street, Kingston.
Knox Educational Services, Spaldings.(10/-)

JAPAN. — Maruzen Co. Ltd., 6 Tori-Nichome, Nihonbashi, P.O. Box 605 Tokyo Central, Tokyo. (Yen 500).

JORDAN. — Joseph L. Bahous & Co., Dar ul-Kutub, Salt Road, P.O.B. 66, Amman.

KOREA. — Korean National Commission for Unesco, P.O. Box Central 64, Seoul.

LUXEMBOURG. — Librairie Paul Bruck, 33, Grand-Rue, Luxembourg.

MALAYAN FEDERATION AND SINGAPORE. — Federal Publications Ltd., Times House, River Valley Rd.. 135, Singapore.

MALTA. — Sapienza's Library, 26 Kingsway, Valetta. (10/-)

MONACO. — British Library, 30 Bld des Moulins, Monte-Carlo. (7 NF.)

NETHERLANDS. — N.V. Martinus Nijhoff, Lange Voorhout, 9, The Hague. (fl 6)

NEW ZEALAND. — Unesco Publications Centre, 100 Hackthorne Road, Christchurch. (10/-).

NIGERIA. — C.M.S. Bookshop, P.O. Box 174, Lagos. (10/-)

NORWAY. — A.S. Bokhjornet, Stortingsplass, 7, Oslo. (N. kr. 10)

PAKISTAN. — The West-Pak Publishing Co, Ltd., Unesco Publications House P.O. Box 374, 56-N Gulberg Industrial Colony Lahore.

PANAMA. — Cultural Panamena, Avenida 7a, No. Ti-49, Apartado de Correos 2018, Panama, D.F.

PHILIPPINES. — Philippine Education Co. Inc., 1104 Castillejos, Quiapo, P.O. Box 620, Manila.

POLAND. — "RUCH" ul. Wiloza Nr. 46. Warsaw. 10 (Zl. 50.)

PORTUGAL. — Dias & Andrada Lda, Livraria Portugal, Rua do Carmo 70, Lisbon.

SOUTH AFRICA. — Van Schaik's Bookstore, Libri Building, Church Street, P.O. Box 724, Pretoria. (10/-)

SWEDEN. For The Unesco Courier: Svenska Unescorädet, Vasagatan 15-17, Stockholm, C (Kr. 7.50) other publications A/B C.E. Fritzes, Kungl. Hovbokhandel, Fredsgatan 2, Stockholm.

SWITZERLAND. — Europa Verlag, 5 Rämistrasse, Zurich.
Payot, 40, rue du Marché, Geneva. C.C.P. 1-236. (fr. s. 7.)

THAILAND. — Suksapan Panit, Mansion 9, Rajdamnern Avenue, Bangkok.

TURKEY. — Librairie Hachette, 469 Istiklal Caddesi, Beyoglu, Istanbul.

UNION OF SOUTH AFRICA. — Van Schaik's Bookstore, Libri Building, Church' Street, Pretoria (10/-).

UNITED ARAB REPUBLIC (EGYPT). — La Renaissance d'Egypte, 9 Sh. Adly-Pasha, Cairo.

UNITED KINGDOM. — H.M. Stationery Office, P.O. Box 569, London, S.E.I.(10/-).

UNITED STATES. — Unesco Publications Center, 801 Third Avenue, New York, 22, N.Y. ($ 3.00.) and (except periodicals): Columbia University Press, 2960 Broadway, New York, 27, N.Y.

U.S.S.R. — Mezhdunarodnaja Kniga, Moscow. G-200.

YUGOSLAVIA. — Jugoslovenska Knjïga, Terazije 27/11. Belgrade.

Letters to the Editor

APPEAL TO HUMAN SOLIDARITY

Sir,

Your February issue (Save the Treasures of Nubia) was nothing short of marvellous. I was greatly moved by the appeal you launched and I think that you would do well to open a subscription list because many people of modest means would willingly make some sacrifices in order to add, through the sum total of their small, individual contributions, to the tremendous amount of aid which will be needed to bring such a project to fruition.

I think the knowledge of all the other peoples—their hardships, intelligence, kindness, outlook and the greatness of spirit shown by some of them—which you bring to us is a great encouragement and makes possible, especially in such tragic circumstances as those we recently witnessed in Agadir, a great surge of solidarity, as well as the hope that still greater things can be achieved.

Madame A. Argnani
Paris

Sir,

I should like to suggest a way of financing the great undertaking in Nubia. Why not put on sale throughout the world reproductions of the threatened treasures? These reproductions could include postcards, pocket collections of photographs, albums and art plates, films and art slides and miniature reproductions of the bas-reliefs. The provision of materials to meet every pocket would enable the maximum number of people to participate.

A. Gevensan
Amiens, France

PLAIN SPOKEN OR ROSE COLOURED

Sir,

UNESCO is founded on a fiction: the equality of peoples, nations and races. This equality is true before God, but does not exist in fact. Your magazine therefore faces two obstacles: either you describe the countries of the world as they are, thus risking the criticism and resentment of your less privileged members or else you look at everything through rose-coloured spectacles with the result that you place the Papuan tom-tom on the same level as Mozart. I realize that your job is not an easy one, but is it really necessary? It may be useful as far as popularization goes; anthropologically speaking, however, it cannot be treated with any seriousness.

M. E. Burgard
Paris

CONSTRUCTIVE OUTLOOK

Sir,

As a regular subscriber to THE UNESCO COURIER I would like to say that the magazine is extremely good in that it does what no other magazine does —it is entirely constructive and uncontroversial.

Dr G.W. Pailthorpe
Crowborough, England

From the Unesco Newsroom

GLASS AND METAL PLANT FOOD: Waste from the metal and chemical industries is now providing micro-fertilizer to improve crop yields in the Soviet Union. The waste used in this way contains copper, zinc, manganese and other metals and the use of less than one pound of such micro-fertilizer (which costs practically nothing) over two and a half acres raised wheat yields by between 50% and 100% and those of sugar beet by one third. The use of glassfrit, containing zinc, molybdenum, manganese and boron was found to increase the growth of maize, barley, grasses, fruit and berries.

■ **THEATRE OF THE NATIONS:** *Performances by companies of African actors and dancers from the Ivory Coast and the Mali Federation mark this year's international season at the Theatre of the Nations in Paris, from March* 15 *to July* 13 *at the Sarah Bernhardt Theatre. Performances by the Ivory Coast group include plays depicting life in West Africa and also folk dances, while the Mali group includes the famous masked Dogon dancers. Appearing for the first time in the Theatre of the Nations is the "Little Ballet Troup" of Bombay, a Turkish song and dance ensemble, a Korean company presenting ballets and operas and the British Sadler's Wells Opera in a production of "Oedipus Rex" by Stravinsky.*

THE POISONED AIR: Scientists studying air pollution in Czechoslovakia have found that the deposit of dust in the industrial sectors of Prague has risen from 260 tons to 700 tons per square kilometre in recent years. The danger to public health is reflected by increases in the incidence of certain diseases, and agricultural losses are estimated at 70,000 tons of cereals annually. Among the measures proposed to combat air pollution is the use of a new kind of smoke filter perfected by the Czech Air Conditioning Research Institute which is said to remove 98% of the solid particles from smoke.

■ **SHORT OF SCHOOLS:** *By the end of* 1959 *Latin America's population had reached the record figure of* 200 *million according to U.N. statistics. Due to the impact which this has had on the economic and social conditions of the Continent's* 20 *republics, millions of people must adapt to new ways of life and millions of youngsters must be trained for the tasks and techniques of modern civilization. But at least half a million new teachers are needed for the* 14 *or* 15 *million children who today cannot be educated because of lack of schools. Latin America's gigantic educational problem is reviewed in a* UNESCO *book, "The State of Education in Latin America" (Price* $2.50; 12/6; 8.75 NF).

MORE TOBACCO GROWN AND SMOKED: People produced and smoked more tobacco last year according to a report published recently by the U.N. Food and Agriculture Organization. World production in 1959, excluding that of the U.S.S.R. and Continental China was about three million metric tons—about 38,000 tons more than in 1958 and about ten per cent more than the production ten years ago. Tobacco consumption—already increased—is expected to increase still more. Production of filter-type cigarettes, small cigars and cigarillos has meant more cigarettes per pound of tobacco, but in the long run consumption is being boosted by a larger number of smokers—more and more women are smoking and "beginners" are starting to smoke at an earlier age.

THE UNESCO PHILATELIC SERVICE

The second commemorative stamp of the year issued by the United Nations Postal Administration (above) marks a special occasion in the history of U.N. stamps. This is the first multicolour stamp, printed by the photogravure process, to be issued by the U.N. Postal Administration. It honours the Economic Commission for Asia and the Far East (ECAFE), one of the regional commissions of the U.N. Economic and Social Council. The stamp, printed in 4 cent and 8 cent denominations, has been on sale from April 11. It can be obtained from The Unesco Philatelic Service which has stamps and first day covers issued by many Member States to commemorate important events in the history of Unesco and the U.N. (inauguration of Unesco's New Headquarters, Human Rights Day, World Refugee Year). As the agent in France of the U.N. Postal Administration, Unesco's Philatelic Service stocks all the United Nations stamps currently on sale. Information on items available, their price and the methods of payment, will be sent on request by Unesco's Philatelic Service, Place de Fontenoy, Paris 7e

■ **STARVED OF NEWS:** *The urgent need to develop information media in Southeast Asia is stressed in the report of a special meeting convened by* UNESCO *in Bangkok recently to discuss press, film, radio and TV problems in this part of the world. For example,* 52 *million additional copies of daily newspapers would be needed to meet the minimum requirement of ten newspapers for every hundred persons. Representatives of* 22 *countries attended the meeting which was part of a survey of information needs being made by* UNESCO *for the U.N. Similar meetings are to be held in Santiago (Chile) for Latin America, and in Addis Ababa (Ethiopia) for Africa.*

SOLAR POWERED FACTORIES : Ultraviolet radiation received from the sun is used to produce chemicals in experiments being made with a steerable aluminium mirror 27 feet in diameter at a solar energy laboratory operated by the University of Algiers. With the use of this mirror, which is steered to follow the sun, and of raw materials in the shape of nitrogen and oxygen from the air, and water, it is possible to produce nitrate fertilizers which may one day be cheap enough to compete with other fertilizers. Scientists hope it may eventually be possible to set up solar factories in the Atlas Mountains or on the edge of the Sahara which could produce fertilizers for the cultivation schemes of arid regions.

■ **VACATIONS ABROAD:** *Opportunities for combining vacations with cultural and educational activities in more than* 75 *countries are listed in the latest edition of Unesco's handbook,* Vacations Abroad (1). *The book contains descriptions in English, French and Spanish of holiday possibilities with courses, study tours and work camps. Information is given on* 1,500 *programmes for vacation study as well as on financial aid available.*

AFRICAN NEW WRITING: The growing importance of literary works by authors of African descent was demonstrated recently at an exhibition of books, entitled "African New Writing", held at Ibadan in Nigeria. At this display, organized jointly by the University College of Ibadan and the British Council, the word African was used in its widest sense to include all present-day authors of African descent. The 250 books and periodicals were by authors who came from as far apart from the West Indies and Central Africa and the U.S.A. and South Africa. One striking feature was that practically all the books were written by living authors and had been published only recently.

(1) "Vacations Abroad". Vol. XII, 1960. Price: $1.25; 6/-; 4.50 NF.

Imp. GEORGES LANG, PARIS. IMPRIMÉ EN FRANCE.

EVERYONE CAN HELP TO SAVE THE MONUMENTS OF NUBIA

Everyone can help Unesco's International Campaign to Save the Monuments of Nubia. Donations should be sent to UNESCO, Place de Fontenoy, Paris, or to banks listed below. Cheques, money orders, etc., should be made payable to UNESCO (Nubia Account). Donations may be made in any currency.

AFGHANISTAN : Da Afghanistan Bank, Kabul.

ALBANIA : State Bank of Albania, Tirana.

ARGENTINE : The First National City Bank of New York, Buenos Aires.

AUSTRALIA : Commonwealth Trading Bank of Australia, Sydney, N.S.W.

AUSTRIA : Creditanstalt-Bankverein, Vienna 1.

BELGIUM : Banque de la Société Générale de Belgique, Brussels 1.

BYELORUSSIA (S.S.R. of) : State Bank of U.S.S.R., Moscow.

BOLIVIA : Banco Central de Bolivia, La Paz.

BRAZIL : The First National City Bank of New York, Rio de Janeiro.

BULGARIA : National Bank of Bulgaria, Sofia.

BURMA : Lloyds Bank Ltd., Rangoon.

CAMBODIA : Banque de l'Indochine, Phnom-Penh.

CANADA : The Royal Bank of Canada, Ottawa, Ontario.

CEYLON : The Chartered Bank, Colombo 1.

CHILE : The First National City Bank of New York, Santiago de Chile.

CHINA (Republic of) : Bank of Taiwan, Taipeh.

COLOMBIA : The First National City Bank of New York, Bogota.

COSTA RICA : Banco Anglo-Costarricense, San Jose.

CUBA : The First National City Bank of New York, Habana.

DENMARK : Kjobenhavns Handelsbank A. S., Copenhagen.

ECUADOR : Banco Central del Ecuador, Quito.

EL SALVADOR : Banco de Comercio de El Salvador, San Salvador.

SPAIN : Banco Hispano-Americano, Madrid.

ETHIOPIA : State Bank of Ethiopia, Addis Ababa.

FINLAND : Helsingfors Aktiebank, Helsinki.

FRANCE : Societe Generale, Agence AG., Paris or Post Office account CCP. No 11.723-16 Paris.

GERMANY (Federal Republic of) : Deutsche Bank AG, Frankfurt on Main.

GHANA : Barclays Bank D.C.O., Accra.

GREECE : Commercial Bank of Greece, Athens.

GUATEMALA : Bank of London & Montreal Ltd., Guatemala.

GUINEA : B.N.C.I., Konakry.

HAITI : Banque Nationale de la Republique d'Haiti, Port-au-Prince.

HONDURAS : Banco de Honduras, Tegucigalpa, DC.

HUNGARY : National Bank of Hungary, Budapest.

INDIA : Lloyds Bank Ltd., New Delhi 1.

INDONESIA : Bank of Indonesia, Djakarta.

IRAN : Bank Melli, Head Office, Teheran.

IRAQ : Ottoman Bank, Baghdad.

ISRAEL : Bank Leumi Le-Israel, BM, Haifa.

ITALY : Banco di Roma, Rome.

JAPAN : The First National City Bank of New York, Tokyo.

JORDAN : Ottoman Bank, Amman.

KOREA : The Bank of Korea, Seoul.

KUWAIT : British Bank of the Middle East, Kuwait.

LAOS : Banque de l'Indochine, Vientiane.

LEBANON : The First National City Bank of New York, Beirut.

LIBERIA : The Bank of Monrovia, Monrovia.

LIBYA : Barclays Bank D.C.O., Tripoli.

LUXEMBURG : Banque Générale du Luxembourg, Luxemburg.

MALAYA (FEDERATED STATES OF) : The First National City Bank of New York, Kuala Lumpur.

MOROCCO : B.N.C.I. (Afrique), Rabat.

MEXICO : The First National City Bank of New York, Mexico D.F.

MONACO : Lloyds Bank (Foreign) Ltd., Monte-Carlo.

NEPAL : Nepal Bank, Katmandu.

NETHERLANDS : Amsterdamsche Bank NV, The Hague.

NEW ZEALAND : Bank of New Zealand, Wellington, Cl.

NICARAGUA : Banco Nacional de Nicaragua, Managua.

NIGERIA (FEDERATION OF) : British Bank of West Africa, Lagos.

NORWAY : Den Norske Creditbank, Oslo.

PAKISTAN : Lloyds Bank Ltd., Karachi.

PANAMA : First National City Bank of New York, Panamá City.

PARAGUAY : The First National City Bank of New York, Ascension.

PERU : The First National City Bank of New York, Lima.

PHILIPPINES : The First National City Bank of New York, Manila.

POLAND : Bank Handlowy w Warszawie SA, Warsaw.

DOMINICAN REPUBLIC : Banco de Reservas de la Republica Dominicana, Ciudad Truhillo.

UNITED ARAB REPUBLIC : The First National City Bank of New York, Cairo (Egypt). — Banque de Syrie et du Liban, Damascus (Syria).

RUMANIA : Banque d'Etat de la République populaire roumaine, Bucarest.

SAUDI ARABIA : The First National City Bank of New York, Jeddah.

SIERRA LEONE : Barclays Bank DCO, Freetown.

SINGAPORE : The First National City Bank of New York, Singapore.

SOMALILAND : Banco di Roma, Mogadiscio.

SUDAN : Barclays Bank DCO, Khartoum.

SWEDEN : Stockholms Enskilda Bank, Stockholm 16.

SWITZERLAND : Banque Populaire Suisse, Zurich.

CZECHOSLOVAKIA : Statni Banka Ceskoslovenska, Prague 3.

THAILAND : The Siam Commercial Bank, Bangkok.

TUNISIA : B.N.C.I. (Afrique), Tunis.

TURKEY : Ottoman Bank, Head Office, Ankara.

UKRAINIAN S.S.R. : State Bank of U.S.S.R., Moscow.

UNITED KINGDOM : Lloyds Bank (Foreign) Ltd., 10 Moorgate, London E.C.2.

U.S.S.R. : State Bank of U.S.S.R., Moscow.

URUGUAY : The First National City Bank of New York, Montevideo.

U.S.A. : The First National City Bank of New York, 55 Wall Street, New York 15.

VENEZUELA : The First National City Bank of New York, Caracas.

VIET-NAM : Banque Française de l'Asie, Saigon.

WEST INDIES (FEDERATION OF THE) : Barclays Bank D.C.O., Port of Spain (Trinidad).

YUGOSLAVIA : Banque nationale de la République fédérative populaire de Yougoslavie, Belgrade.

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